



No.:
REDSZ2025-0107-EMC

TEST REPORT

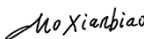
NAME OF SAMPLE : NeoEyes NE101 Sensing Camera

APPLICANT : Xiamen CamThink Technology Co., Ltd.

CLASSIFICATION OF TEST : N/A

CVC Testing Technology (Shenzhen) Co., Ltd.



Applicant		Name: Xiamen CamThink Technology Co., Ltd. Address: Building C09, Software Park Phase III, Xiamen 361024, Fujian, China	
Manufacturer		Name: Xiamen CamThink Technology Co., Ltd. Address: Building C09, Software Park Phase III, Xiamen 361024, Fujian, China	
Equipment Under Test		Product Name: NeoEyes NE101 Sensing Camera Model Name: NE101-L01GL Additional Model Name: NT101-L01GL Brand Name: CamThink Serial NO.: N/A Sample NO.: 202507115892-5	
Date of Receipt.	Jul. 14, 2025	Date of Testing	Jul. 14, 2025 ~ Aug. 06, 2025
Test Specification		Test Result	
EN 55032:2015 + A11:2020, CLASS B EN 55035:2017 + A11:2020 EN 301 489-1 V2.2.3 (2019-11) EN 301 489-17 V3.3.1 (2024-09) EN 301 489-52 V1.3.1 (2024-11)		PASS	
Evaluation of Test Result		The equipment under test was found to comply with the requirements of the standards applied. Seal of CVC Issue Date: Aug.06,2025	
Compiled by:  Zhu Yulin Name Signature		Reviewed by:  Mo Xianbiao Name Signature	Approved by:  Dong Sanbi Name Signature
Other Aspects: NONE.			
Abbreviations: OK, Pass= passed Fail = failed N/A= not applicable EUT= equipment, sample(s) under tested			

This test report relates only to the EUT, and shall not be reproduced except in full, without written approval of CVC.



TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1. SUMMARY OF TEST RESULTS	5
1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS	6
1.2 MEASUREMENT UNCERTAINTY	7
1.3 TEST LOCATION	7
2. GENERAL INFORMATION	8
2.1 GENERAL PRODUCT INFORMATION	8
2.2 DESCRIPTION OF ACCESSORIES	8
2.3 INDEPENDENT OPERATION MODES	9
2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS	10
2.5 DESCRIPTION OF SUPPORT UNITS	11
3. EMISSION	12
3.1 RADIATED EMISSION MEASUREMENT	12
4. IMMUNITY TEST	20
4.1 PERFORMANCE CRITERIA	20
4.2 ELECTROSTATIC DISCHARGE (ESD)	25
4.3 RF ELECTROMAGNETIC FIELD (RS)	29
5. PHOTOGRAPHS OF TEST SETUP	33



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
REDSZ2025-0107-EMC	Original release	Aug. 06, 2025



1. SUMMARY OF TEST RESULTS

EMISSION			
Standard	Test Item	Result	Remarks
EN 55032:2015+A11:2020, CLASS B EN 301 489-1 V2.2.3 (2019-11) EN 301 489-17 V3.3.1 (2024-09) EN 301 489-52 V1.3.1 (2024-11)	Radiated Test (30MHz~ 1GHz)	PASS	Minimum passing margin is 14.09dB at 685.689MHz
	Radiated Test (Above 1GHz)	PASS	Minimum passing margin is 27.90dB at 5018.402MHz

IMMUNITY (EN 55035:2017+A11:2020, ETSI EN 301 489-1 V2.2.3)					
Standard	Test Item	Class / Severity	Performance	Criteria	Result
IEC 61000-4-2:2008 EN 61000-4-2:2009	Electrostatic discharge immunity test	$\pm 2\text{kV}, \pm 4\text{kV}, \pm 8\text{kV}$ Air $\pm 2\text{kV}, \pm 4\text{kV}$ Contact, $\pm 4\text{kV}$ Coupling Plane	CT/CR	A	PASS
IEC 61000-4-3:2020 EN 61000-4-3:2006 +A1:2008 + A2:2010	Radiated, radio-frequency, electromagnetic field immunity test	80-6000 MHz, 3V/m, 80% AM (1kHz)	CT/CR	A	PASS



1.1 LIST OF TEST AND MEASUREMENT INSTRUMENTS

RE Test - 3M Chamber					
Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
EMI Test Receiver	Rohde&Schwarz	ESR 26	101718	1 year	2026/5/21
Loop antenna(8.3k~30MHz)	Rohde&Schwarz	HFH2-Z2E	100951	1 year	2026/4/22
Antenna(30MHz~1000MHz)	SCHWARZBECK	VULB 9168	01132	1 year	2026/2/27
Horn antenna(1GHz-18GHz)	SCHWARZBECK	BBHA9120D	02793	1 year	2026/1/20
3m anechoic chamber	MORI	966	N/A	1 year	2026/5/18
Preamplifier(10kHz-1GHz)	Rohde&Schwarz	SCU-01F	100298	1 year	2026/4/22
Preamplifier(1GHz-18GHz)	Rohde&Schwarz	SCU-18F	100799	1 year	2026/4/22
Attenuator	/	SJ-5dB	607684	1 year	2026/2/27
#1 control room	MORI	433	/	1 year	2026/5/16
Temperature and humidity meter	/	C193561473	C193561473	1 year	2026/4/28
ESD Test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
ESD Signal generator	TESEQ	NSG437	1517	1 year	2026/5/20
Temperature and humidity meter	UNI-T	A10T	C193561455	1 year	2026/4/28
RS Test system					
Equipment	Manufacturer	Model No.	Serial Number	Cal. interval	Cal. Due
Fully anechoic chamber	MORI	844	N/A	3 year	2026/5/16
Analog signal Generator (8kHz ~ 12.75GHz)	Rohde&Schwarz	SMA 100B	103802	1 year	2026/4/22
Conditioning amplifier	B&K	2690-OS2	3010386	1 year	2026/4/22
Audio Analyzer	Rohde&Schwarz	UPV	104719	1 year	2026/4/22
Temperature and humidity meter	/	C193561464	C193561464	1 year	2026/4/28
Wideband radio communication tester	Rohde&Schwarz	CMW 500	168588	1 year	2026/5/22
Power Sensor	R&S	NRP-Z81	106173	1 year	2026/4/22
TX antenna	SCHWARZBECK	STLP9129	CS0200041	N/A	N/A
Power amplifier	Rohde&Schwarz	BBA150-A400	CS0200045	1 year	2026/4/22
Power amplifier	Rohde&Schwarz	BBA150-BC250	CS0200046	1 year	2026/4/22
Power amplifier	Rohde&Schwarz	BBA150-D110E100	CS0200047	1 year	2026/6/5



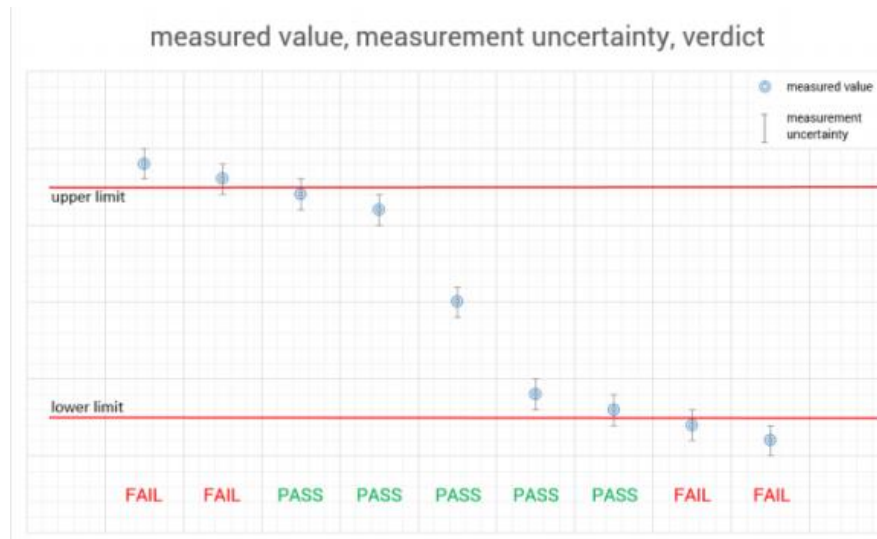
1.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

No.	Item	Measurement Uncertainty
1	Conducte demission test	+/- 2.7 dB
2	Radiated emission 30MHz-1GHz	+/- 4.6 dB
3	Radiated emission 1GHz-18GHz	+/- 4.4 dB
4	Volatage fluctuations and flicker	±1.4 %
Remark: 95% Confidence Levels, k=2.		

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed.

The measurement uncertainty is mentioned in this test report, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 5% that the decision might be wrong.



1.3 TEST LOCATION

The tests and measurements refer to this report were performed by EMC testing Lab of CVC Testing Technology (Shenzhen) Co., Ltd.

Address: No. 1301-14, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China

Post Code: 518110 Tel: 0755-23763060-8805
Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn
FCC(Test firm designation number: CN1363)
IC(Test firm CAB identifier number: CN0137)
CNAS(Test firm designation number: L16091)



2. GENERAL INFORMATION

2.1 GENERAL PRODUCT INFORMATION

PRODUCT NAME	NeoEyes NE101 Sensing Camera
BRAND NAME	CamThink
MODEL NAME	NE101-L01GL
ADDITIONAL MODEL NAME (Remark 5)	NT101-L01GL
POWER SUPPLY	DC 6V(4*1.5V AAA battery)
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	N/A
Remark: - For more detailed features description, please refer to the manufacturer's specifications or the User's Manual. - For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report. - EUT photo refer to the report (Report NO.: REDSZ2025-0107-EUT) - Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, CVC is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion. - This sample only differs in model name.	

2.2 DESCRIPTION OF ACCESSORIES

N/A



2.3 INDEPENDENT OPERATION MODES

EMISSION Test Modes		
For Radiated Emission Tests		
Test Mode		Test Voltage
1	Normal Working + WiFi Link + WWAN Link	DC 6V
2	Stand by	DC 6V
Remark: The above test modes in boldface were the worst cases, only the test data of these modes were reported.		

IMMUNITY Test Modes		
For ESD, RS Immunity Tests		
Test Mode		Test Voltage
1	Normal Working + WiFi Link + WWAN Link	DC 6V
2	Stand by	DC 6V
Remark: The above test modes in boldface were the worst cases, only the test data of these modes were reported.		



2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product, according to the specifications of the manufacturers. It must comply with the requirements of the following standards:

EN 55032:2015 + A11:2020, CLASS B
EN 55035:2017 + A11:2020
EN 301 489-1 V2.2.3 (2019-11)
EN 301 489-17 V3.3.1 (2024-09)
EN 301 489-52 V1.3.1 (2024-11)
IEC 61000-4-2:2008
IEC 61000-4-3:2020
EN 61000-4-2:2009
EN 61000-4-3:2006 + A1:2008 + A2:2010

All test items have been performed and recorded as per the above standards.



2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support Equipment							
NO	Description	Brand	Model No.	Serial Number	Supplied by		
1	N/A	N/A	N/A	N/A	N/A		
Support Cable							
NO	Description	Quantity (Number)	Length (m)	Detachable (Yes/ No)	Shielded (Yes/ No)	Cores (Number)	Supplied by
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A



3. EMISSION

3.1 Radiated emission Measurement

Receiver Setup:

Frequency: (f) (MHz)	Detector type	Measurement receiver bandwidth	
		RBW	VBW
$30 \leq f \leq 1\,000$	Quasi Peak	120 kHz	300 kHz
$f \geq 1000$	Peak	1 MHz	3 MHz
	Average	1 MHz	3 MHz

Measured frequency range:

Required highest frequency for radiated measurement	
Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108\text{ MHz}$	1 GHz
$108\text{ MHz} < F_x \leq 500\text{ MHz}$	2 GHz
$500\text{ MHz} < F_x \leq 1\text{ GHz}$	5 GHz
$F_x > 1\text{ GHz}$	$5 \times F_x$ up to a maximum of 6 GHz

NOTE 1 For FM and TV broadcast receivers, Fx is determined from the highest frequency generated or used excluding the local oscillator and tuned frequencies.

NOTE 2 Fx is defined in 3.1.18.

NOTE 3 For outdoor units of home satellite receiving systems highest measured frequency shall be 18 GHz.

3.1.1 Limits Of Radiated Emission Measurement

Class A

Requirements for radiated emissions at frequencies up to 1 GHz for class A equipment.

Requirements for radiated emissions at frequencies up to 1 GHz for class A equipment:			
Frequency range (MHz)	Measurement receiver bandwidth		Class A limits dB(µV/m)
	Distance (m)	Detector type / bandwidth	
30 to 230	10	Quasi Peak / 120 kHz	40
230 to 1 000			47
30 to 230	3		50
230 to 1 000			57

Requirements for radiated emissions at frequencies above 1 GHz for class A equipment.

Frequency range (MHz)	Measurement receiver bandwidth		Class A limits dB(μV/m)
	Distance (m)	Detector type / bandwidth	
1 000 to 3 000	3	Average / 1 MHz	56
3 000 to 6 000			60
1 000 to 3 000		Peak / 1 MHz	76
3 000 to 6 000			80



Class B

Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment

Requirements for Radiated emissions at frequencies up to 1 GHz for class B equipment			
Frequency range (MHz)	Measurement receiver bandwidth		Class B limits dB(µV/m)
	Distance (m)	Detector type / bandwidth	
30 to 230	10	Quasi Peak / 120 kHz	30
230 to 1 000			37
30 to 230	3		40
230 to 1 000			47

Requirements for radiated emissions at frequencies above 1 GHz for class B equipment

Frequency range (MHz)	Measurement receiver bandwidth		Class B limits dB(μV/m)
	Distance (m)	Detector type / bandwidth	
1 000 to 3 000	3	Average / 1 MHz	50
3 000 to 6 000			54
1 000 to 3 000		Peak / 1 MHz	70
3 000 to 6 000			74

Requirements for radiated emissions from FM receivers

Frequency range (MHz)	Measurement receiver bandwidth		Class B limits dB(μV/m)	
	Distance (m)	Detector type / bandwidth	Fundamental	Harmonics
30 to 230	10	Quasi Peak / 120 kHz	50	42
230 to 300				42
300 to 1 000				46
30 to 230	3		60	52
230 to 300				52
300 to 1 000				56



3.1.2 Test Procedures

1. From 30 MHz to 1GHz test procedure as below:

- 1) The radiated emissions were tested in a semi-anechoic chamber.
- 2) The Product was placed on the non-conductive turntable 0.8 m above the ground at a chamber.
- 3) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 4) For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

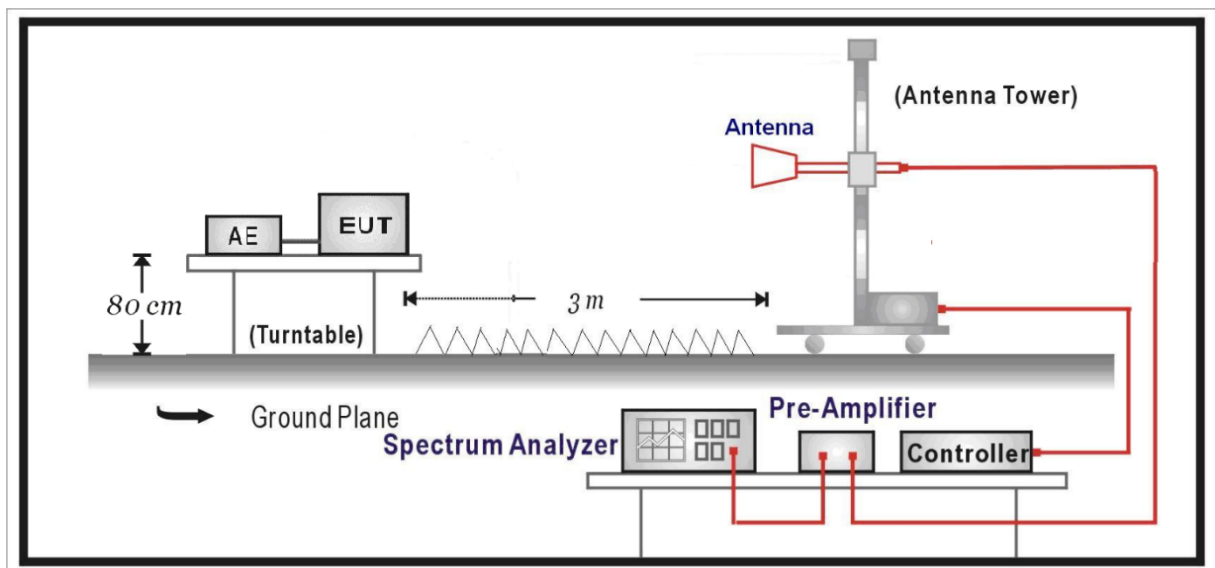
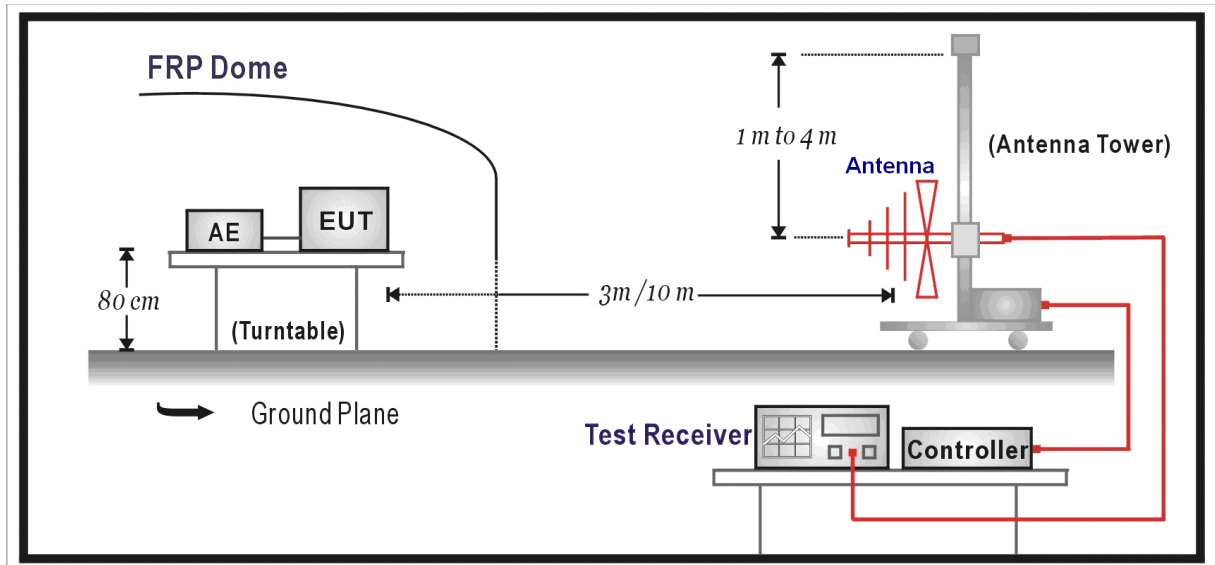
2. Above 1GHz test procedure as below:

- 1) The radiated emissions were tested in a fully Anechoic Chamber.
- 2) Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- 3) For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Remark:

- a. $\text{Correct Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$, the value was added to Original Receiver Reading by the software automatically.
- b. $\text{Margin} = \text{Result} - \text{Limit}$

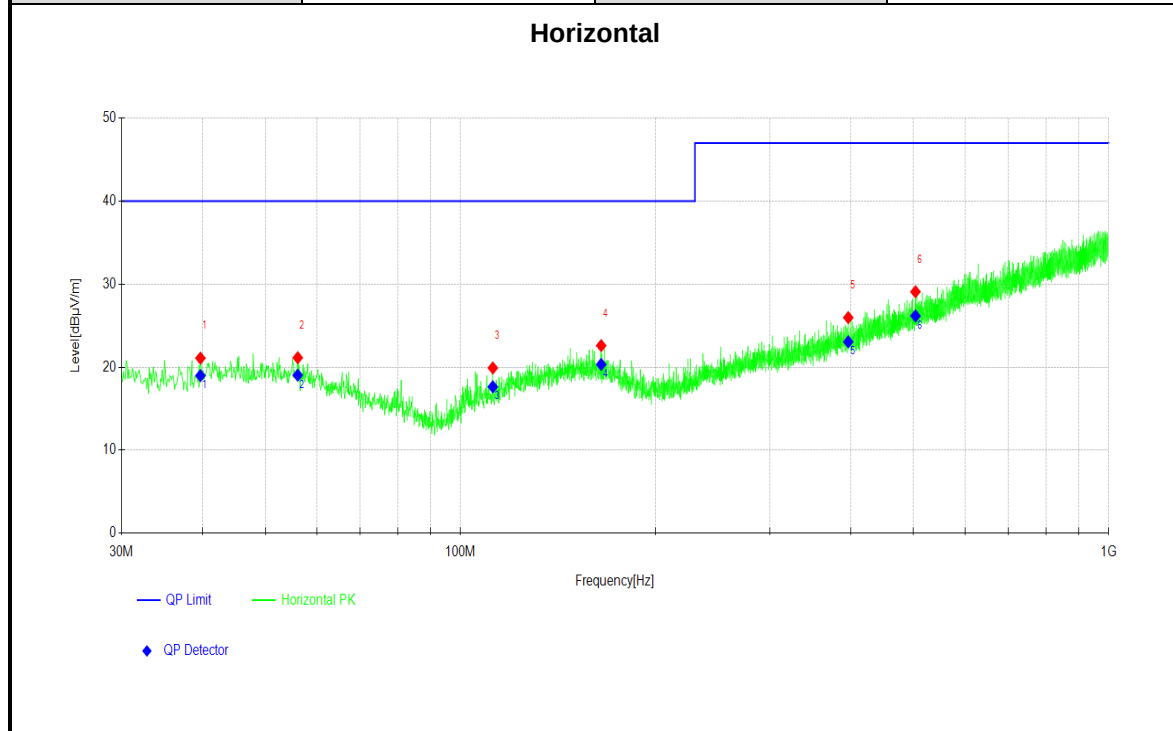
3.1.3 Test setup





3.1.4 Test Results (Below 1GHz)

Test Mode:	See section 2.3	Frequency Range	30-1000MHz
Test Voltage	See section 2.3	Detector Function	Quasi-Peak
Environmental Conditions	25.1deg. C,54% RH	Tested By	Zhou Ye



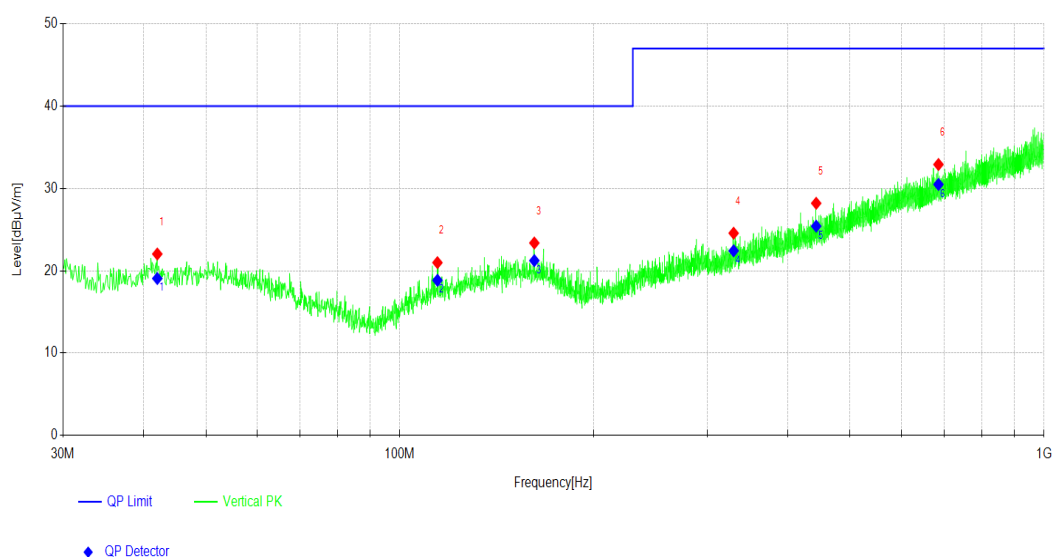
NO.	Freq. [MHz]	Reading [dB μ V/m]	Factor [dB]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]
1	39.701	1.79	19.30	21.09	40.00	18.91	100	124
2	56.096	1.21	19.93	21.14	40.00	18.86	100	8
3	112.167	2.65	17.26	19.91	40.00	20.09	100	170
4	164.843	2.51	20.09	22.60	40.00	17.40	100	342
5	396.503	2.93	23.04	25.97	47.00	21.03	100	56
6	503.407	3.72	25.37	29.09	47.00	17.91	100	94

Remark: The emission levels of other frequencies were very low against the limit.



Test Mode:	See section 2.3	Frequency Range	30-1000MHz
Test Voltage	See section 2.3	Detector Function	Quasi-Peak
Environmental Conditions	25.1deg. C,54% RH	Tested By	Zhou Ye

Vertical



NO.	Freq. [MHz]	Reading [dB μ V/m]	Factor [dB]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]
1	42.029	2.30	19.74	22.04	40.00	17.96	100	196
2	114.398	3.48	17.51	20.99	40.00	19.01	100	356
3	161.739	3.22	20.16	23.38	40.00	16.62	100	205
4	329.760	3.08	21.49	24.57	47.00	22.43	100	311
5	442.970	3.85	24.35	28.20	47.00	18.80	100	108
6	685.689	4.40	28.51	32.91	47.00	14.09	100	14

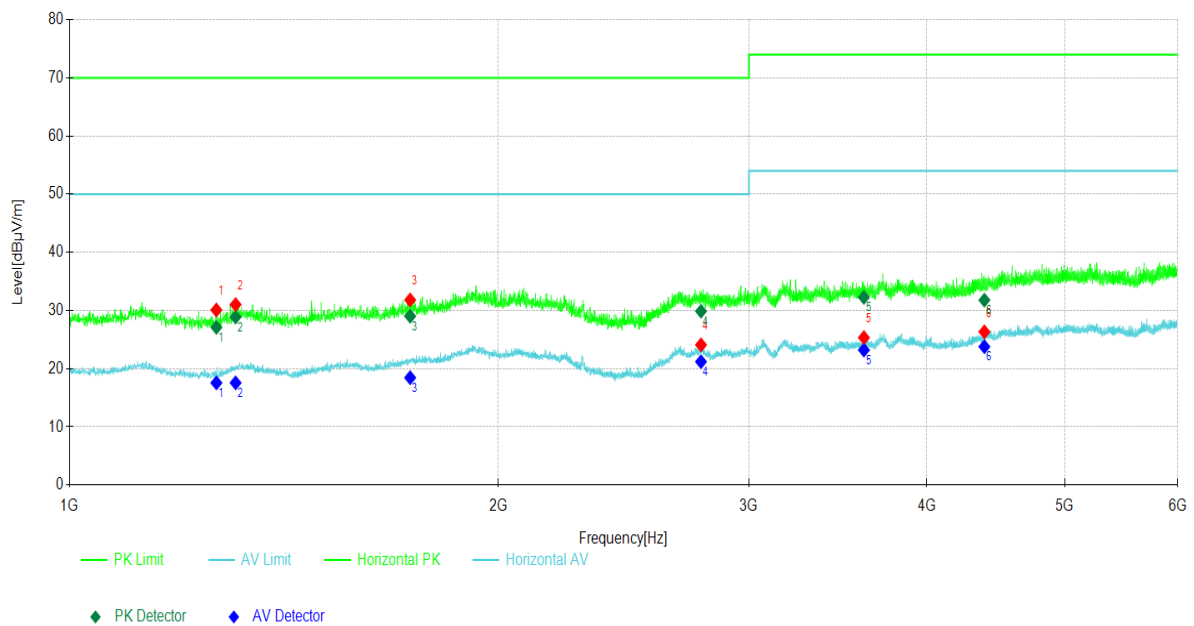
Remark: The emission levels of other frequencies were very low against the limit.



3.1.5 Test Results (Above 1GHz)

Test Mode:	See section 2.3	Frequency Range	Above 1G
Test Voltage	See section 2.3	Detector Function	PK/AV
Environmental Conditions	25.3deg. C,56% RH	Tested By	Wang Zhiming

Horizontal



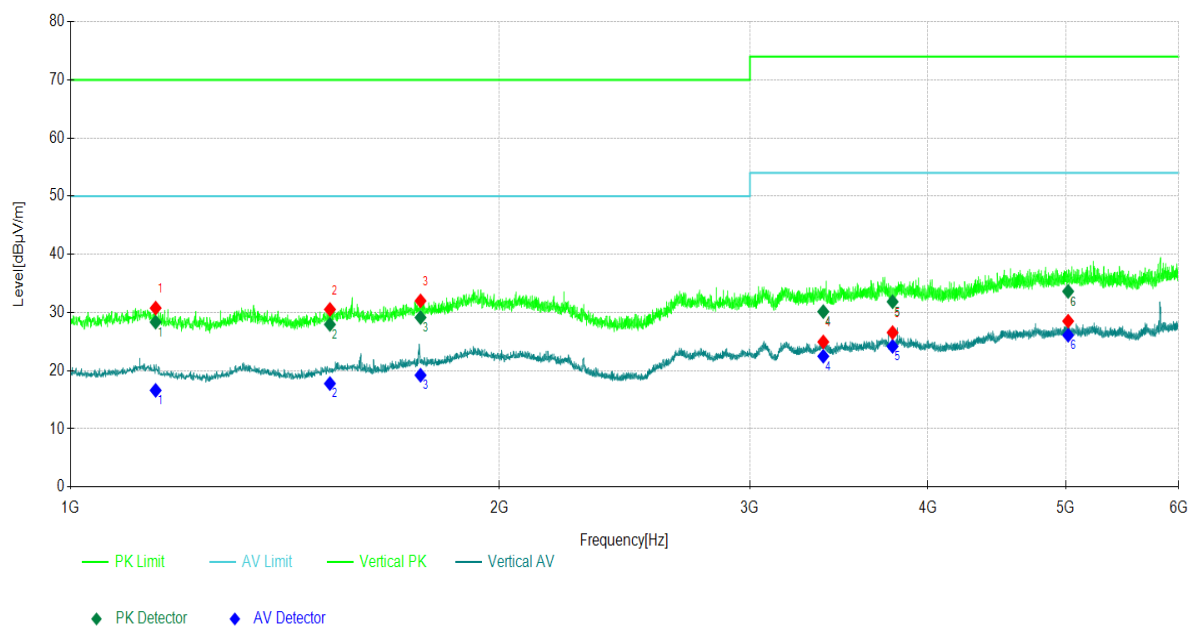
NO.	Frequency [MHz]	Factor [dB/m]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]
1	1268.027	-29.51	27.11	70.00	42.89	17.56	50.00	32.44	100	191
2	1308.031	-29.50	28.87	70.00	41.13	17.57	50.00	32.43	100	288
3	1734.573	-28.43	29.02	70.00	40.98	18.46	50.00	31.54	100	269
4	2776.178	-26.01	29.88	70.00	40.12	21.21	50.00	28.79	100	201
5	3612.761	-23.67	32.27	74.00	41.73	23.21	54.00	30.79	100	225
6	4389.839	-21.20	31.79	74.00	42.21	23.79	54.00	30.21	100	312

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dBuV/m] - Level [dBuV/m]



Test Mode:	See section 2.3	Frequency Range	Above 1G
Test Voltage	See section 2.3	Detector Function	PK/AV
Environmental Conditions	25.3deg. C,56% RH	Tested By	Wang Zhiming

Vertical



NO.	Frequency [MHz]	Factor [dB]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]
1	1147.515	-29.59	28.35	70.00	41.65	16.62	50.00	33.38	100	133
2	1521.052	-29.33	27.95	70.00	42.05	17.79	50.00	32.21	100	68
3	1761.076	-28.25	29.14	70.00	40.86	19.23	50.00	30.77	100	348
4	3377.738	-24.10	30.16	74.00	43.84	22.48	54.00	31.52	100	343
5	3778.278	-22.97	31.86	74.00	42.14	24.19	54.00	29.81	100	128
6	5018.402	-18.84	33.63	74.00	40.37	26.10	54.00	27.90	100	48

Remark: 1. The emission levels of other frequencies were greater than 20dB margin.
2. Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. Margin(dB) = Limit[dBuV/m] - Level [dBuV/m]



4. IMMUNITY TEST

4.1 Performance Criteria

4.1.1 General Performance Criteria Description

EN 55035: 2017 + A11: 2020

<General>

General performance criteria are defined in 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.

<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.



ETSI EN 301 489-1

Criteria	Performance Criteria
CT/ CR	If no further details are given in the relevant part of ETSI EN 301 489 series [i.13] dealing with the particular type of radio equipment, the following general performance criteria for continuous phenomena shall apply. During and after the test, the equipment shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer when the equipment is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. During the test the EUT shall not unintentionally transmit or change its actual operating state and stored data. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
TT/ TR	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 restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A SW reboot is not allowed. 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. A SW reboot is not allowed. Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. For all other ports the following applies: • After the test, the equipment shall continue to operate as intended. No degradation of performance or loss of function is allowed below a permissible performance level specified by the manufacturer, when the equipment is used as intended. In some cases this permissible performance level may be replaced by a permissible loss of performance. • During the EMC exposure to an electromagnetic phenomenon, a degradation of performance is, however, allowed. No change of the actual mode of operation (e.g. unintended transmission) or stored data is allowed. • If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be deduced from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.



ETSI EN 301 489-17

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 allows a level of degradation in accordance Minimum performance level		
Minimum performance level		
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, the minimum performance level shall be no loss of the wireless transmission function needed for the intended use of the equipment.		

Criteria	Performance Criteria
Performance criteria for Continuous phenomena	Performance criteria for Transient phenomena 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 301 489-52

Criteria	GSM and DCS Performance Criteria
CT	During the test, the uplink speech output level shall be at least 35 dB (± 3 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). At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or critical stored data, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.
CR	During the test, the RXQUAL of the downlink shall not exceed the value of three, measured during each individual exposure in the test sequence. During the test, the downlink speech output level shall be at least 35 dB (± 3 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). At the conclusion of the test, the EUT shall operate as intended with no loss of user control functions or critical stored data, and the communication link shall have been maintained
TT	A communications link shall be established at the start of the test, clauses 4.2 to 4.2.4. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained. In addition to confirming the above performance during a call, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.
TR	A communications link shall be established at the start of the test. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained.

Criteria	CDMA Direct Spread (UTRA and E-UTRA) Performance Criteria
Continuous phenomena	UTRA: In the data transfer mode, the performance criteria can be one of the following: • if the BER (as referred in ETSI TS 134 109 [4]) is used, it shall not exceed 0,001 during the test sequence; • if the BLER (as referred in ETSI TS 134 109 [4]) is used, it shall not exceed 0,01 during the test sequence. The BLER calculation shall be based on evaluating the CRC on each transport block. E-UTRA: 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 ETSI TS 136 101 [9] with parameters specified in tables 7.3.1-1 and 7.3.1-2 in ETSI TS 136 101 [9] during the test sequence.



Transient phenomena	A communications link shall be established at the start of the test, clauses 4.1 and 4.2. At the conclusion of each exposure the EUT shall operate with no user noticeable loss of the communication link. At the conclusion of the total test comprising the series of individual exposures, the EUT shall operate as intended with no loss of user control functions or stored data, as declared by the manufacturer, and the communication link shall have been maintained. In addition to confirming the above performance in traffic mode, the test shall also be performed in idle mode, and the transmitter shall not unintentionally operate.
----------------------------	---



4.2 Electrostatic discharge (ESD)

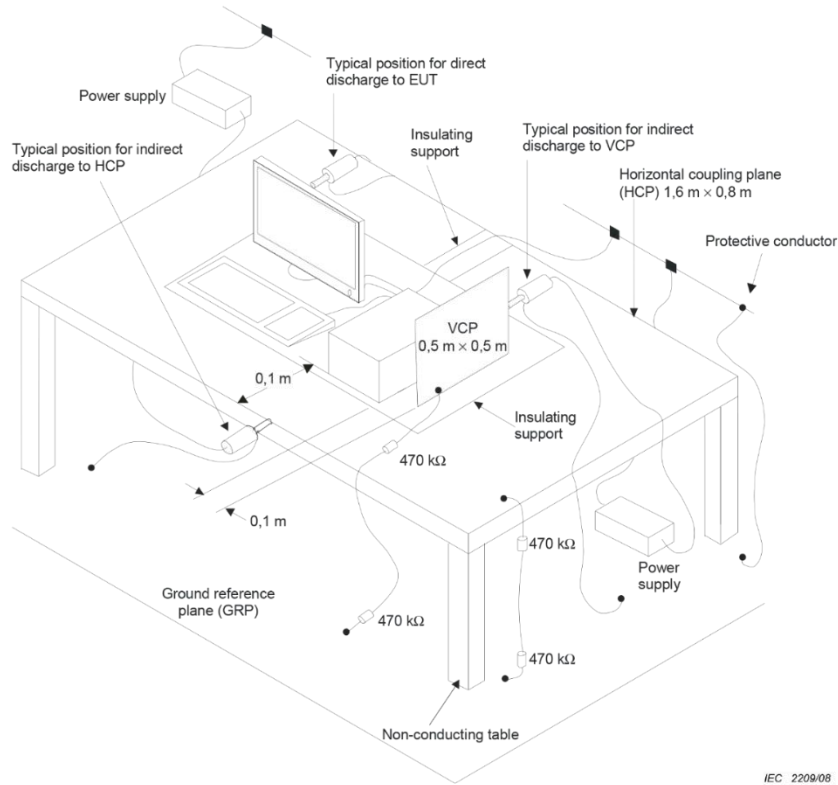
4.2.1 Test Specification

Basic Standard:	IEC 61000-4-2, EN 61000-4-2
Discharge Impedance:	330 ohm / 150 pF
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1-second
Criterion Required:	performance criteria B

4.2.2 Test Procedure

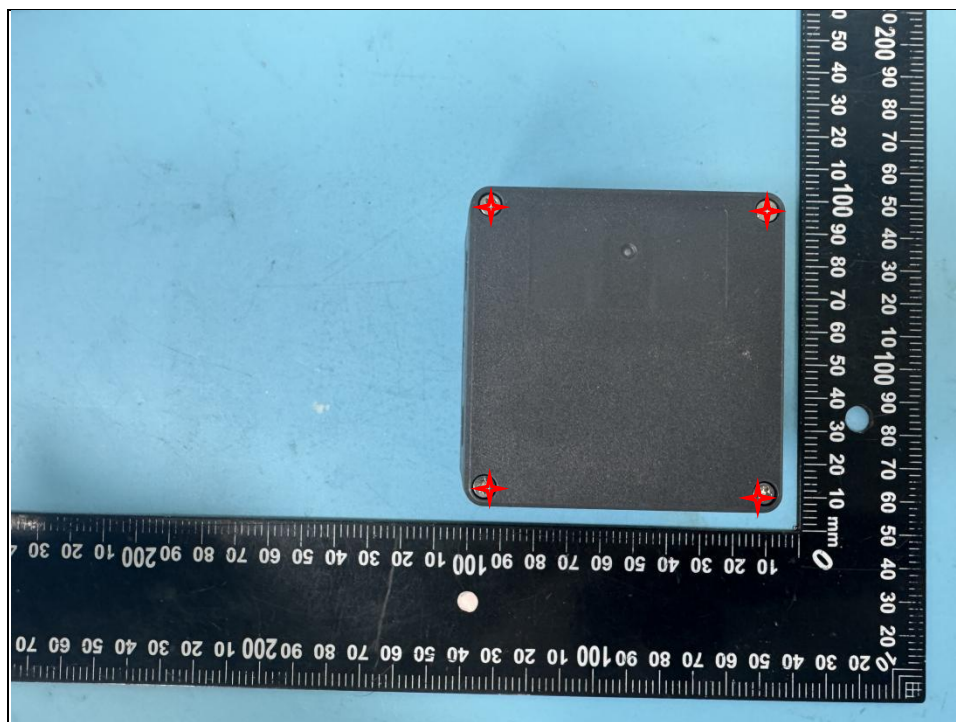
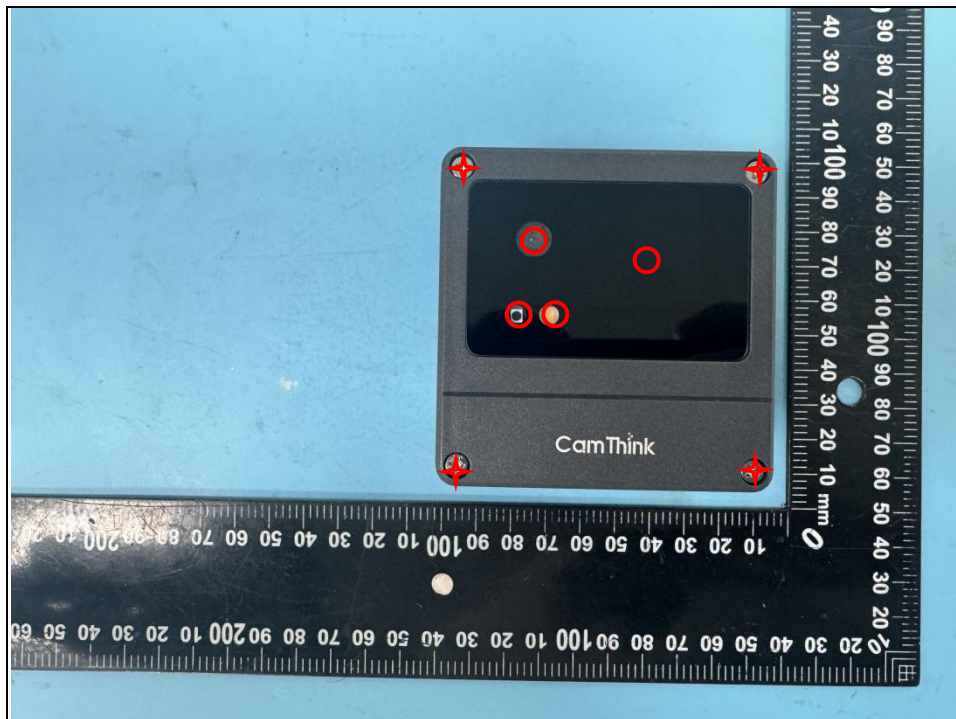
- 1) Electrostatic discharges shall be applied only to points and surfaces of the EUT which are expected to be touched during normal operation, including user access operations specified in the user manual, for example cleaning or adding consumables when the EUT is powered. The application of discharges to the contacts of open connectors is not required.
When applying direct discharges to a portable or handheld battery- powered EUT with a display screen, it may not be possible to observe the screen for a given EUT orientation. If observation of the screen is necessary during this test, the EUT may be mounted vertically using non - metallic supports.
- 2) The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP).
- 3) A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP were constructed from the same material type & think mess as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surface excepted the GRP, HCP and VCP was greater than 1m.
- 4) During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.
- 5) After each discharge, the ESD generator was removed from the EUT, the generator was then retrigged for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.

4.2.3 Test Setup



4.2.4 ESD TEST POINT

ESD TEST POINT	
○ : Air discharge	✦ : Contact discharge





4.2.5 Test Results

Test Mode:	See section 2.3	Test Voltage	See section 2.3
Environmental Conditions	26.6deg. C,59% RH	Tested By	Wang Zhiming

Discharge Type	Test Level (kV)	Polarity	Test Point	Performance	Criteria	Result
Contact Discharge	4	+ /-	All metal part	CT/CR	A	PASS
Air Discharge	2,4,8	+ /-	All non-metal part	CT/CR	A	PASS
Indirect Discharge	4	+ /-	HCP	CT/CR	A	PASS
	4	+ /-	VCP	CT/CR	A	PASS
There was no change compared with initial operation during the test.						



4.3 RF electromagnetic field (RS)

4.3.1 Test Specification

Basic Standard:	EN 61000-4-3, IEC 61000-4-3
Frequency Range:	swept test: 80 MHz ~ 6000 MHz
Field Strength:	3 V/m
Modulation:	1kHz Sine Wave, 80%, AM Modulation
Frequency Step:	1 % increment
Polarity of Antenna:	Horizontal and Vertical
Antenna Height:	1.5m
Dwell Time:	at least 3 seconds
Criterion Required:	performance criteria A

4.3.2 Test Procedure

- 1) For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.
- 2) If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
- 3) The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).
- 4) The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceed 10 % of the preceding frequency value.
- 5) The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s.
- 6) The test normally was performed with the generating antenna facing each side of the EUT.
- 7) The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.
- 8) The EUT was performed in a configuration to actual installation conditions, a video camera and/or an audio monitor were used to monitor the performance of the EUT.

4.3.3 Test Setup

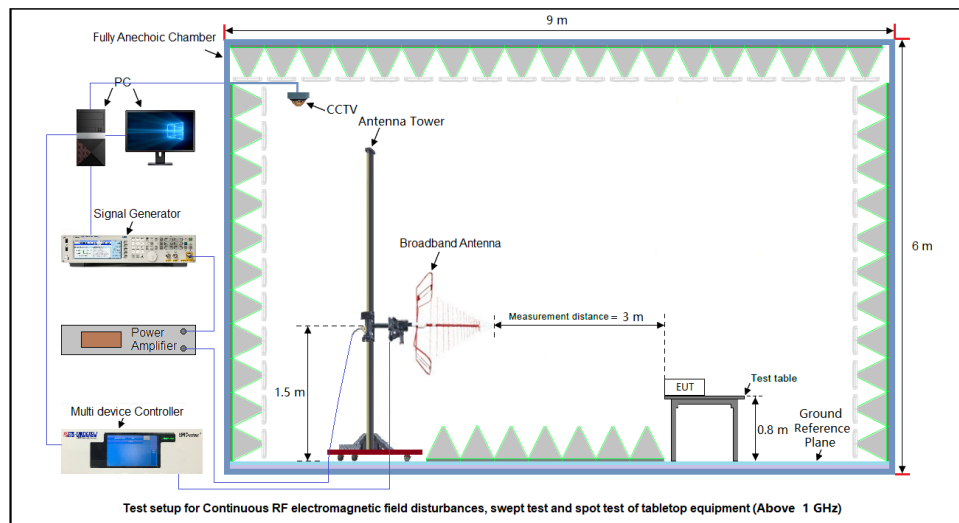


Figure 1. 30 MHz to 1 GHz

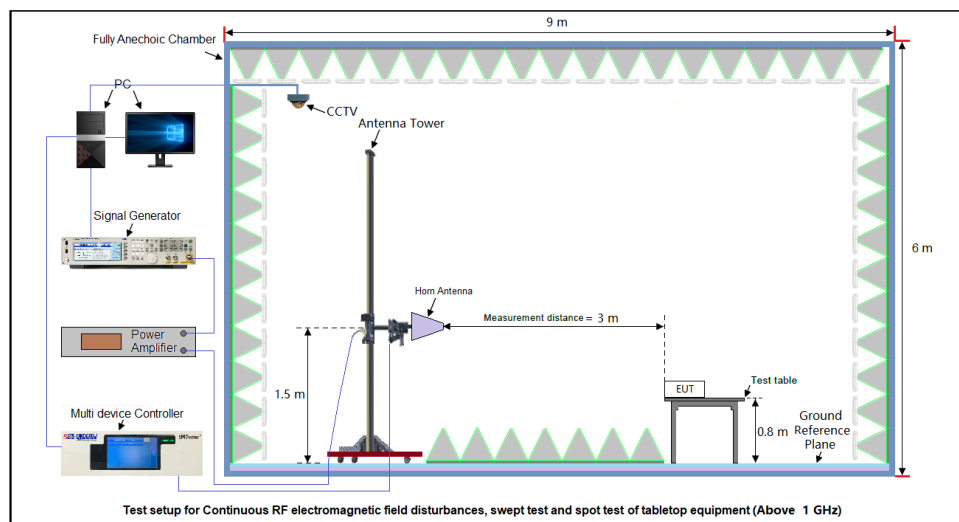


Figure 2. Above 1 GHz



4.3.4 Test Results

Test Mode:	See section 2.3	Test Voltage	See section 2.3
Environmental Conditions	26.6deg. C, 59% RH	Tested By	Wang Zhiming

For EN 55035

Test Frequency	Field Strength	Angle [°]	Polarization of antenna	Test Distance	Result
80-1000MHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz	3 V/m	0/90/180/270	Horizontal& Vertical	3m	PASS
During and after test, EUT is normal working.					

For 2.4G WiFi

Test Frequency	Field Strength	Angle [°]	Polarization of antenna	Test Distance	Test Result
80 MHz to 6 000 MHz	3 V/m	0/90/180/270	Horizontal& Vertical	3m	FER ≤ 10%
During and after test, the FER less than or equal to 10%.					

Worst case of the test modes:

For GSM 900 Throughput

Test Frequency	Field Strength	Angle [°]	Polarization of antenna	Test Distance	Test Result
80 MHz to 6 000 MHz	3 V/m	0/90/180/270	Horizontal& Vertical	3m	Throughput > 95%

Remark:

1. The exclusion band for transmitters is 250 % of the channel width either side of the nominal operating frequency of the transmitter.
2. The exclusion band for receivers shall be calculated by using the following formulae:
3. For the lower edge for the exclusion band: $EXband(lower) = Band_{RX}(lower) - ChW_{RX}$
4. For the upper edge of the exclusion band: $EXband(lower) = Band_{RX}(upper) + ChW_{RX}$
5. During the test, the Maximum throughput was more than 95%



For LTE B1 Throughput

Test Frequency	Field Strength	Angle [°]	Polarization of antenna	Test Distance	Test Result
80 MHz to 6 000 MHz	3 V/m	0/90/180/270	Horizontal& Vertical	3m	Throughput > 95%

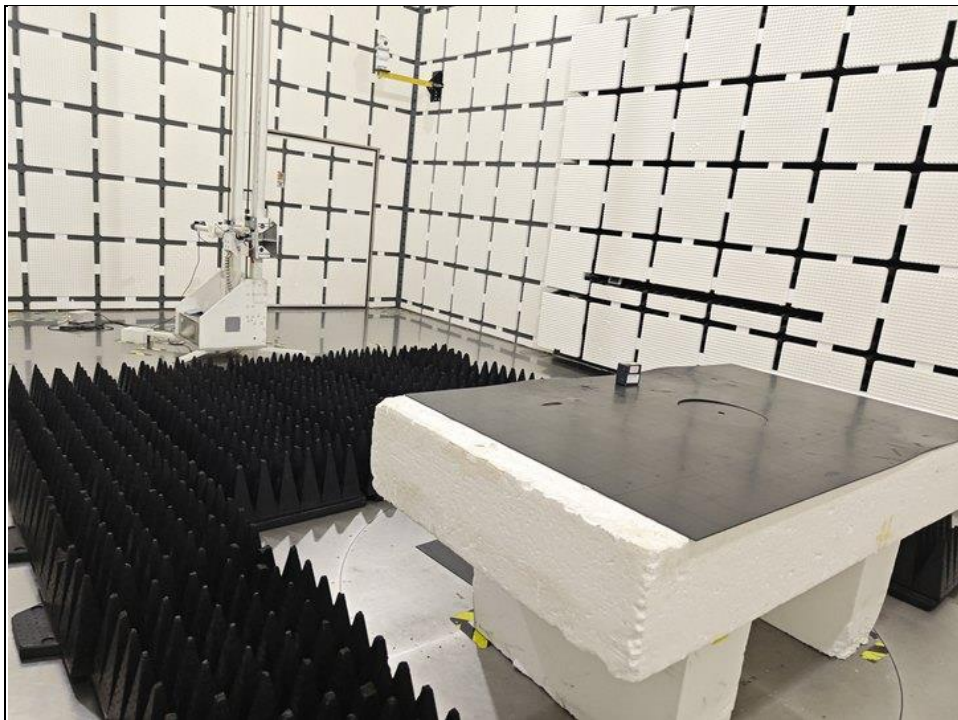
Remark:

1. The exclusion band for transmitters is 250 % of the channel width either side of the nominal operating frequency of the transmitter.
2. The exclusion band for receivers shall be calculated by using the following formulae:
3. For the lower edge for the exclusion band: $EXband(lower) = Band_{RX}(lower) - ChW_{RX}$
4. For the upper edge of the exclusion band: $EXband(upper) = Band_{RX}(upper) + ChW_{RX}$
5. E-UTRA Channel Width 20MHz
6. During the test, the Maximum throughput was more than 95%

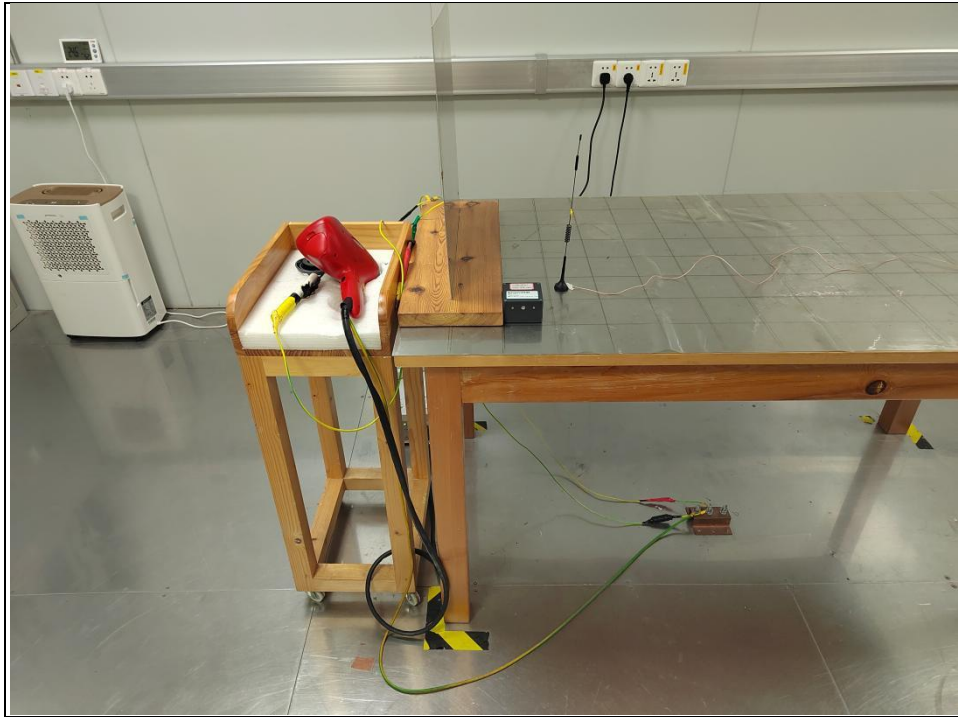
5. PHOTOGRAPHS OF TEST SETUP



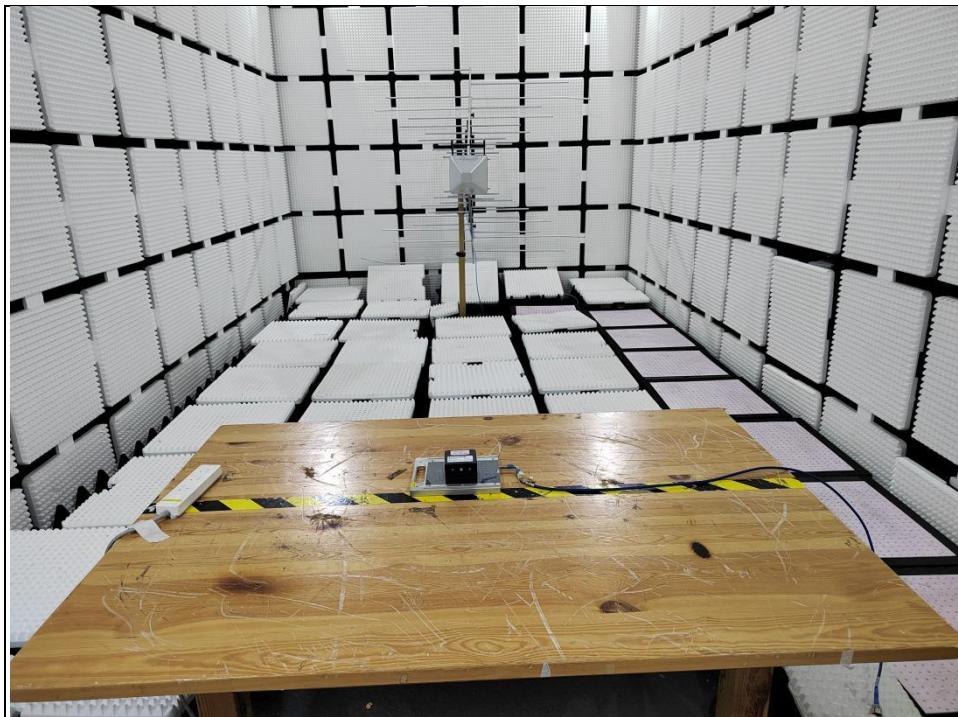
RADIATED EMISSION TEST BELOW 1GHz



RADIATED EMISSION TEST ABOVE 1GHz



ESD TEST



RS TEST



Important

- (1) The test report is invalid without the official stamp of CVC;
- (2) Any part photocopies of the test report are forbidden without the written permission from CVC;
- (3) The test report is invalid without the signatures of tester, reviewer and approver;
- (4) The test report is invalid if altered;
- (5) Objections to the test report must be submitted to CVC within 15 days;
- (6) Generally, commission test results apply to the samples as received. The sample information is provided by the customer and laboratory is not responsible for its authenticity;
- (7) As for the test result “-” or “N” means “not applicable”, “/” means “not test”, “P” means “pass” and “F” means “fail”

Address: No. 1301-14&16, Guanguang Road, Xinlan Community, Guanlan Subdistrict, Longhua District, Shenzhen, Guangdong, China

Post Code: 518110 Tel: 0755-23763060-8805

Fax: 0755-23763060 E-mail: sz-kf@cvc.org.cn