

**EN 55032:2015/A11:2020
EN 55035:2017/A11:2020**

TEST REPORT

For

RK3568 commercial core board

MODEL NUMBER: ATK-CLRK3568B

REPORT NUMBER: E04A24071011E00101

ISSUE DATE: August 6, 2024

Prepared for

**Guangzhou Xingyi Electronic Technology Co., Ltd
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Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District,
Guangzhou City**

Prepared by

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**Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park,
Dongguan city, Guangdong, People's Republic of China, 523808**

This report is based on a single evaluation of the submitted sample(s) of the above mentioned product, it does not imply an assessment of the production of the products.

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	August 6, 2024	Initial Issue	

Summary of Test Results

Emission			
Standard	Test Item	Limit	Result
EN 55032:2015/A11:20 20	Conducted emissions (AC mains power ports)	Clause 5	N/A (NOTE 1, 2)
	Radiated emissions below 1GHz	Clause 5	Pass
	Radiated emissions above 1GHz	Clause 5	Pass

Immunity (EN 55035:2017/A11:2020)				
Basic Standard	Test Item	Test Specification	Criteria	Result
IEC 61000-4-2:2008	Electrostatic Discharge	Contact +/- 4 kV; Air +/- 2 kV; +/- 4 kV; +/- 8 kV	B	Pass
IEC 61000-4-3:2006 +A1:2007+A2:2010	Continuous RF electromagnetic field disturbances	3 V/m, 80 %; 1 kHz, AM 80 MHz-1000 MHz; 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz	A	Pass
IEC 61000-4-4:2012	Electrical fast transients burst (AC mains power ports)	+/- 1.0 kV 5/50 ns, 5 kHz	B	N/A
IEC 61000-4-5:2014	Surges (AC mains power ports)	+/-2 kV (Common) +/-1 kV (Differential) 1.2/50 us	B	N/A
IEC 61000-4-6:2013	Continuous induced RF disturbances (AC mains power ports)	150 kHz-80 MHz 80 %, 1 kHz 0.15 MHz-10 MHz: 3 V 10 MHz-30 MHz: 3 V~1 V 30 MHz-80 MHz: 1 V	A	N/A
IEC 61000-4-8:2009	Power frequency magnetic field	50 Hz, 1 A/m	A	N/A (NOTE 1, 3)
IEC 61000-4-11:2004	Voltage dips and interruptions (AC mains power ports)	Residual < 5 %: 0.5 cycle; Residual 70 %: 25 cycles; Residual < 5 %: 250 cycles;	B,C,C	N/A

Note:

1. N/A: In this whole report not applicable.
2. This test is only applicable for devices which can be charged or powered by AC power cable.
3. Only applicable to EUT containing devices susceptible to magnetic fields, such as CRT monitors, Hall elements, electrodynamic microphones, magnetic field sensors.

*This test report is only published to and used by the applicant, and it is not for evidence purpose in China.

*The measurement result for the sample received is <Pass> according to <EN 55032:2015/A11:2020, EN 55035:2017/A11:2020> when <Accuracy Method> decision rule is applied.

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: Guangzhou Xingyi Electronic Technology Co., Ltd
Address: Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City

Manufacturer Information

Company Name: Guangzhou Xingyi Electronic Technology Co., Ltd
Address: Room 805-808, Room 801, Building 4, No. 1, 3, and 5, Kesheng Road, Guangzhou Private Science and Technology Park, No. 1633 Beitai Road, Baiyun District, Guangzhou City

Factory Information

Company Name: Dongguan Zhichen Electronic Technology Co., Ltd
Address: 301, Building 1, No. 16 Xingui Road, Lincun, Tangxia Town, Dongguan City, Guangdong Province

EUT Information

Product Description: RK3568 commercial core board
Model: ATK-CLRK3568B
Brand: /
Sample Received Date: 25 July 2024
Sample Status: Normal
Sample ID: A24071011 001
Date of Tested: August 1, 2024 to August 6, 2024

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
EN 55032:2015/A11:2020	Pass
EN 55035:2017/A11:2020	Pass

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Laboratory Manager



2. TEST METHODOLOGY

All tests were performed in accordance with the standard EN 55032:2015/A11:2020, EN 55035:2017/A11:2020

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 6947.01) Guangdong Global Testing Technology Co., Ltd. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Designation No.: CN1343) Guangdong Global Testing Technology Co., Ltd. has been recognized to perform compliance testing on equipment subject to Supplier's Declaration of Conformity (SDoC) and Certification rules</p> <p>ISED (Company No.: 30714) Guangdong Global Testing Technology Co., Ltd. has been registered and fully described in a report filed with ISED. The Company Number is 30714 and the test lab Conformity Assessment Body Identifier (CABID) is CN0148.</p>
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Note: All tests measurement facilities use to collect the measurement data are located at Room 101-105, 203-210, Building 1, No.2, Keji 8 Road, Songshan Lake Park, Dongguan city, Guangdong, People's Republic of China, 523808

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Measurement Frequency Range	K	U(dB)
Radiated emissions below 1GHz	30 MHz -1 GHz	2	3.79
Radiated emissions above 1GHz	1 GHz - 18 GHz	2	5.62
Note1: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.			
Note 2: According to the standard CISPR 16-4-2, the MU for the Conducted emissions from the AC mains power ports using AMN should not exceed 3.8 in range of 9kHz to 150kHz and 3.4 in range of 150kHz to 30MHz. We have considered the test results containing the value of U _{lab} (in dB) for the measurement instrumentation actually used for the measurements.			

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name		RK3568 commercial core board
Model		ATK-CLRK3568B
EUT Classification		Class B
Internal Frequency		above 108MHz
Ratings		Input:DC12V 2.5A
Power Supply	DC	DC12V from adapter input AC230V/50Hz

5.2. TEST MODE

Test Mode	Description
M01	Normal working

5.3. EUT ACCESSORY

Adapter	
Model No.:	GQ30B-120250-AC
Input:	100-240 V~50/60 Hz, 1.0 A Max
Output:	DC12V 2.5A
DC Cable:	1.2 Meter, Shielded without ferrite

5.4. SUPPORT UNITS FOR SYSTEM TEST

The EUT has been tested as an independent unit

6. MEASURING EQUIPMENT AND SOFTWARE USED

Test Equipment of Radiated emissions below 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Chamber	ETS	9*6*6	Q2146	2022/8/30	2025/8/29
Receiver	R&S	ESCI3	101409	2023/9/18	2024/9/17
Loop Antenna	ETS	6502	243668	2022/3/30	2025/3/30
Pre-Amplifier	HzEMC	HPA-9K0130	HYP A21001	2023/9/18	2024/9/17
Biconilog Antenna	Schwarzbeck	VULB 9168	1315	2022/10/10	2025/10/9
Biconilog Antenna	ETS	3142E	243646	2022/3/23	2025/3/22
Test Software for RE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Radiated emissions above 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Spectrum Analyzer	R&S	FSV40	101413	2023/9/18	2024/9/17
Pre-Amplifier	HzEMC	HPA-1G1850	HYP A21003	2023/9/18	2024/9/17
Horn antenna	ETS	3117	246069	2022/3/11	2025/3/10
Test Software for RE	Farad	EZ-EMC	V1.1.4.2	N/A	N/A

Test Equipment of Electrostatic Discharge

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
ESD Simulator	TESEQ	NSG437	336	2023/9/20	2024/9/19

Test Equipment of Continuous RF electromagnetic field disturbances					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
Stacked Log-Per-Broadband Antenna	Schwarzbeck	STLP 9129	170	N/A	N/A
Power amplifier	MiCOTOP	MPA-80-1000-500	MPA2209336	2023/9/18	2024/9/17
Power amplifier	MiCOTOP	MPA-1000-6000-100	MPA2209337	2023/9/18	2024/9/17
EPM Series Power Meter	Keysight	N1914A	MY53240003	2023/9/18	2024/9/17
Average Power Sensor	Keysight	E9304A	MY41498925	2023/9/18	2024/9/17
Average Power Sensor	Keysight	E9304A	MY41497454	2023/9/18	2024/9/17
EXG Analog Signal Generator	Keysight	N5171B	MY61252624	2023/9/18	2024/9/17
Field Probe	Narda	EP 601	811ZX11137	2023/9/21	2024/9/20
Microphone kit	Magasig	MPA 663	220803075	2023/9/21	2024/9/20
Test Software for RS	HzEMC	FASLAB-RS	V2.7.2.3	N/A	N/A

7. EMISSION TEST

7.1. RADIATED EMISSIONS BELOW 1GHZ

LIMITS

(a). Limits up to 1 GHz

FREQUENCY (MHz)	Class A		Class B	
	At 10 m	At 3 m	At 10 m	At 3 m
	dB μ V/m	dB μ V/m	dB μ V/m	dB μ V/m
30 – 230	40	50	30	40
230 – 1000	47	57	37	47

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dB μ V/m)=20log Emission level (uV/m).
- (3) If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

TEST PROCEDURE

Below 1 GHz and above 30 MHz

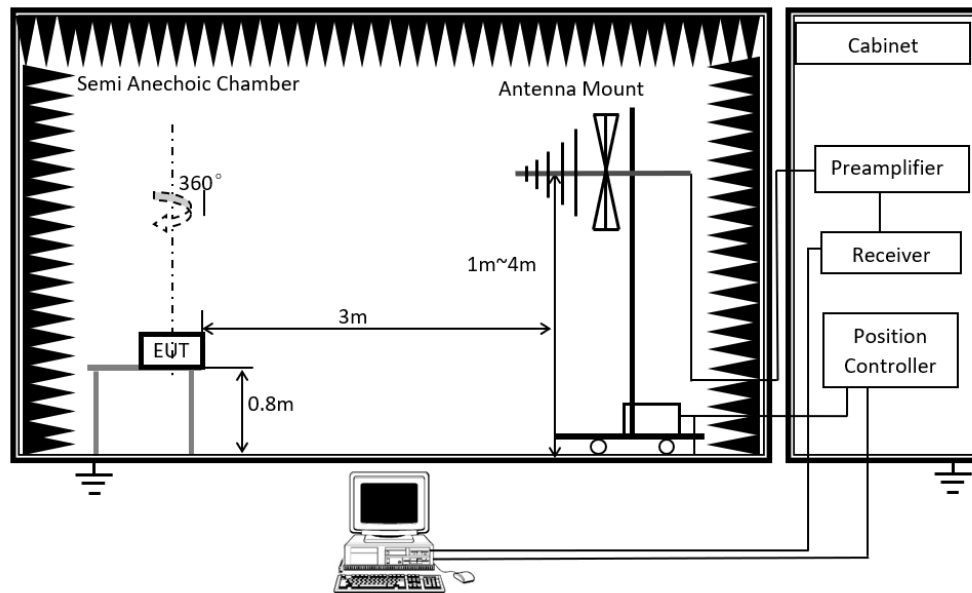
The setting of the spectrum analyzer

RBW	120 kHz
VBW	300 kHz
Sweep	Auto
Detector	Peak and QP
Trace	Max hold

1. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp was used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
2. The EUT was placed on a turntable with 80 cm above ground.
3. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
4. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

5. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal used.
6. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
7. For measurement below 1 GHz, the initial step in collecting Radiated emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

TEST SETUP



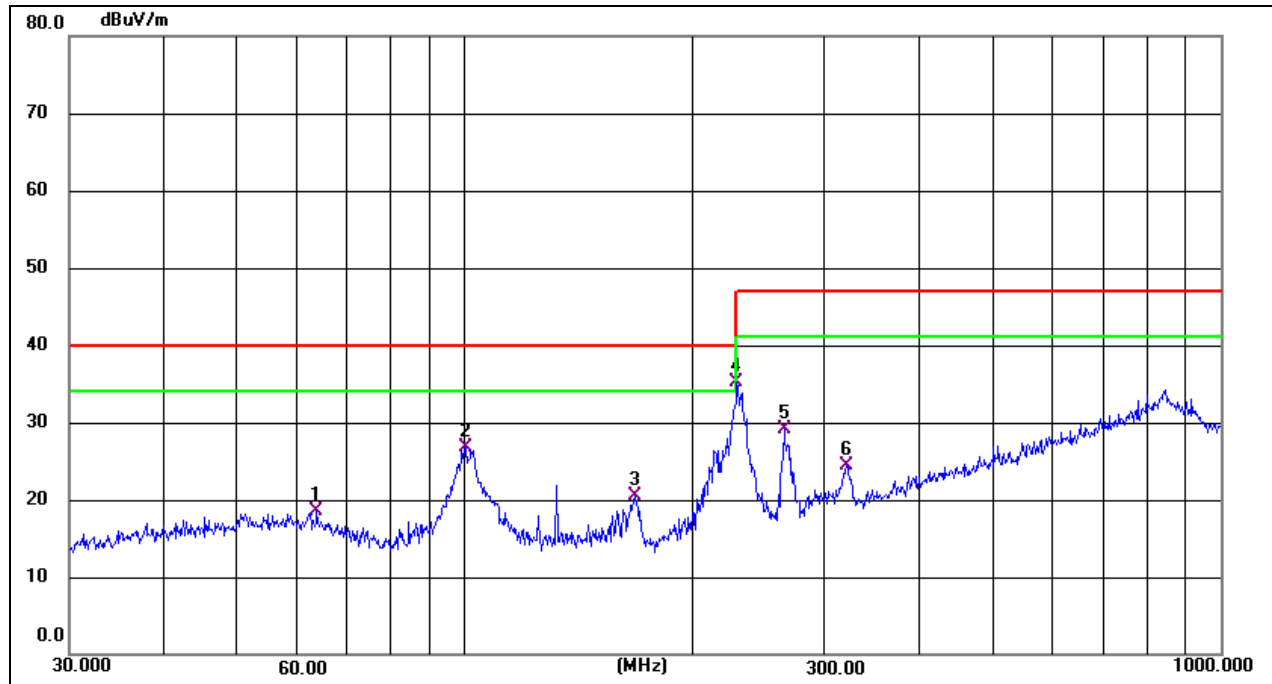
TEST ENVIRONMENT

Temperature	24.3°C	Relative Humidity	51%
Atmosphere Pressure	101kPa		

TEST MODE

Pre-test Mode:	M01 ~ M01
Final Test Mode:	M01

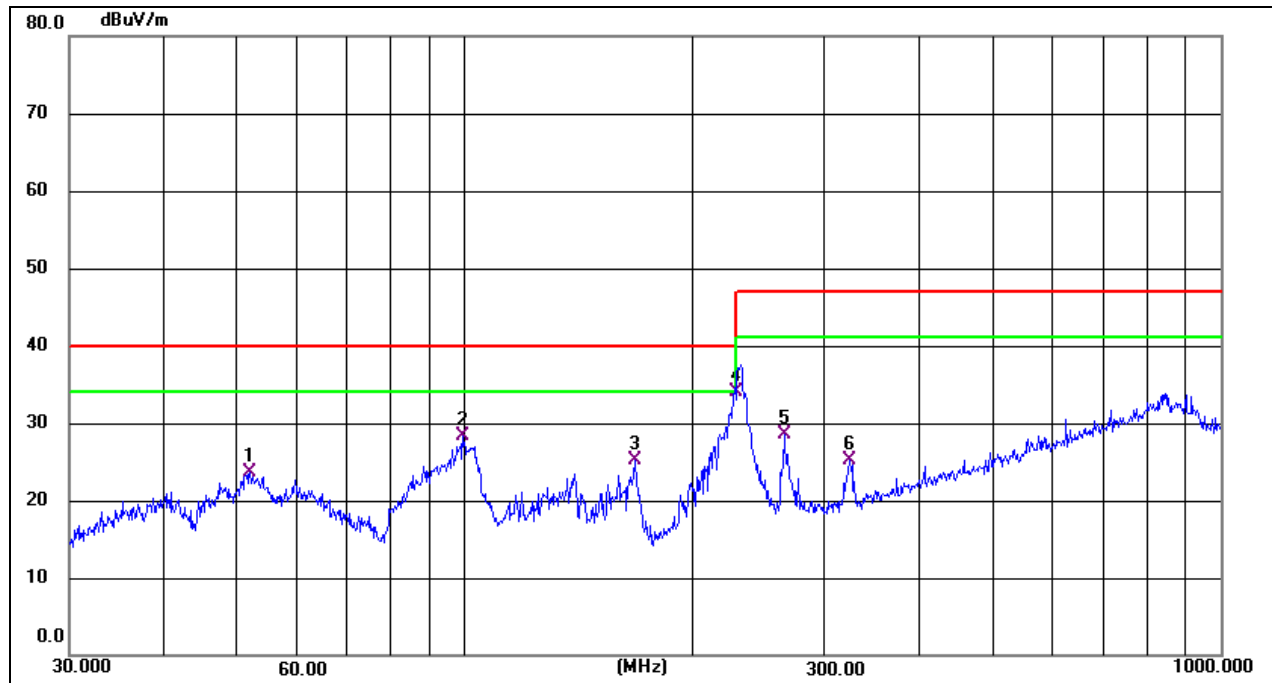
Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

Antenna: Horizontal

Mode: M01

No .	Frequenc y (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measure- ment(dBuV/m)	Limit (dBuV/m)	Over (dB)	Detect or	Commen t
1	63.7588	28.36	-9.78	18.58	40.00	-21.42	QP	
2	100.5806	39.30	-12.48	26.82	40.00	-13.18	QP	
3	167.8243	32.73	-12.15	20.58	40.00	-19.42	QP	
4 *	229.2931	46.67	-11.47	35.20	40.00	-4.80	QP	
5	264.7457	39.09	-9.89	29.20	47.00	-17.80	QP	
6	319.9370	32.53	-8.08	24.45	47.00	-22.55	QP	



Antenna: Vertical

Mode: M01

No .	Frequenc y (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measure- ment(dBuV/m)	Limit (dBuV/m)	Over (dB)	Detect or	Commen t
1	52.0251	33.07	-9.51	23.56	40.00	-16.44	QP	
2	99.5281	40.78	-12.52	28.26	40.00	-11.74	QP	
3	167.8243	37.38	-12.15	25.23	40.00	-14.77	QP	
4 *	229.2930	45.57	-11.47	34.10	40.00	-5.90	QP	
5	264.7457	38.39	-9.89	28.50	47.00	-18.50	QP	
6	323.3204	33.12	-8.00	25.12	47.00	-21.88	QP	

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)

2. Margin = Result - Limit

7.2. RADIATED EMISSIONS ABOVE 1GHZ

LIMITS

(a). Limits above 1 GHz

FREQUENCY (MHz)	Class A (at 3 m) dB μ V/m		Class B (at 3 m) dB μ V/m	
	Peak	Avg	Peak	Avg
1000-6000	80	60	74	54

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dB μ V/m)=20log Emission level (uV/m).
- (3) If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz. If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz. If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

TEST PROCEDURE

Above 1 GHz

The setting of the spectrum analyzer

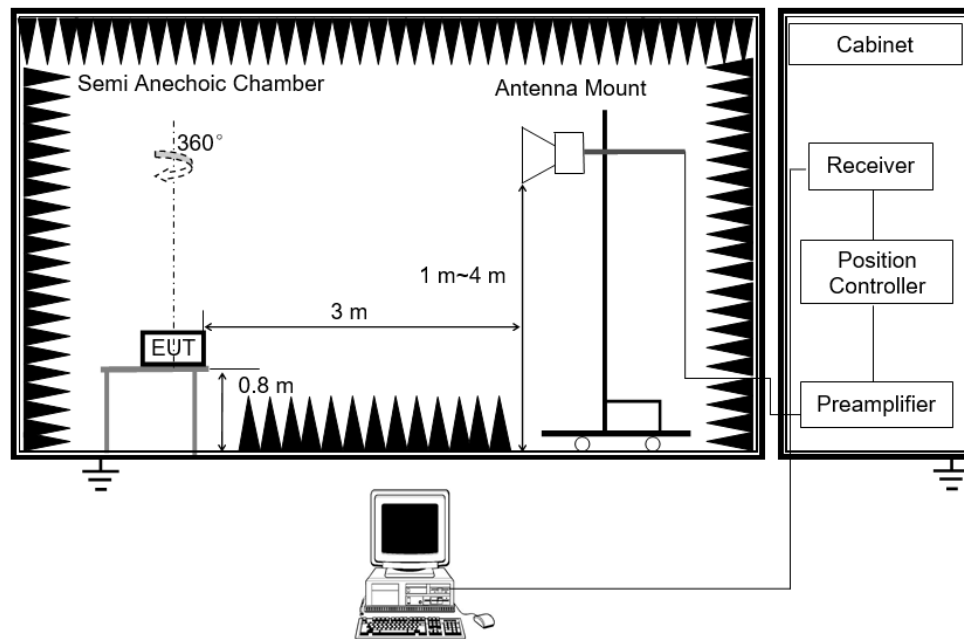
RBW	1 MHz
VBW	3 MHz
Sweep	Auto
Detector	Peak: Peak AVG: RMS
Trace	Max hold

- a. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- b. The EUT was placed on a turntable with 80 cm above ground.
- c. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- d. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance.
The overall length shall not exceed 1 m.
- e. Cables of hand-operated devices, such as keyboards and mice, shall be placed as for normal

used.

- f. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
- g. For measurement above 1 GHz, the peak emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the peak limit. If peak result complies with average limit, average result is deemed to comply with average limit.
- h. The average emission measurement will be measured by the RMS detector and must comply with the average limit.

TEST SETUP



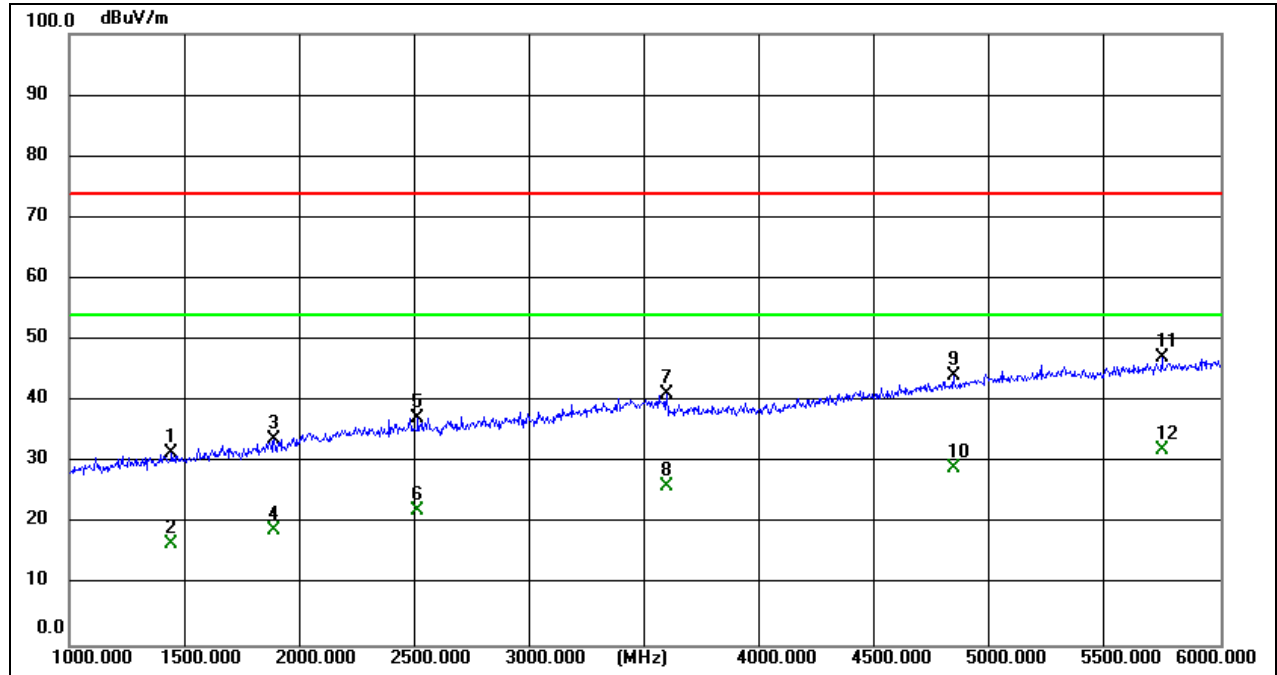
TEST ENVIRONMENT

Temperature	22.5°C	Relative Humidity	51%
Atmosphere Pressure	101kPa		

TEST MODE

Pre-test Mode:	M01 ~ M01
Final Test Mode:	M01

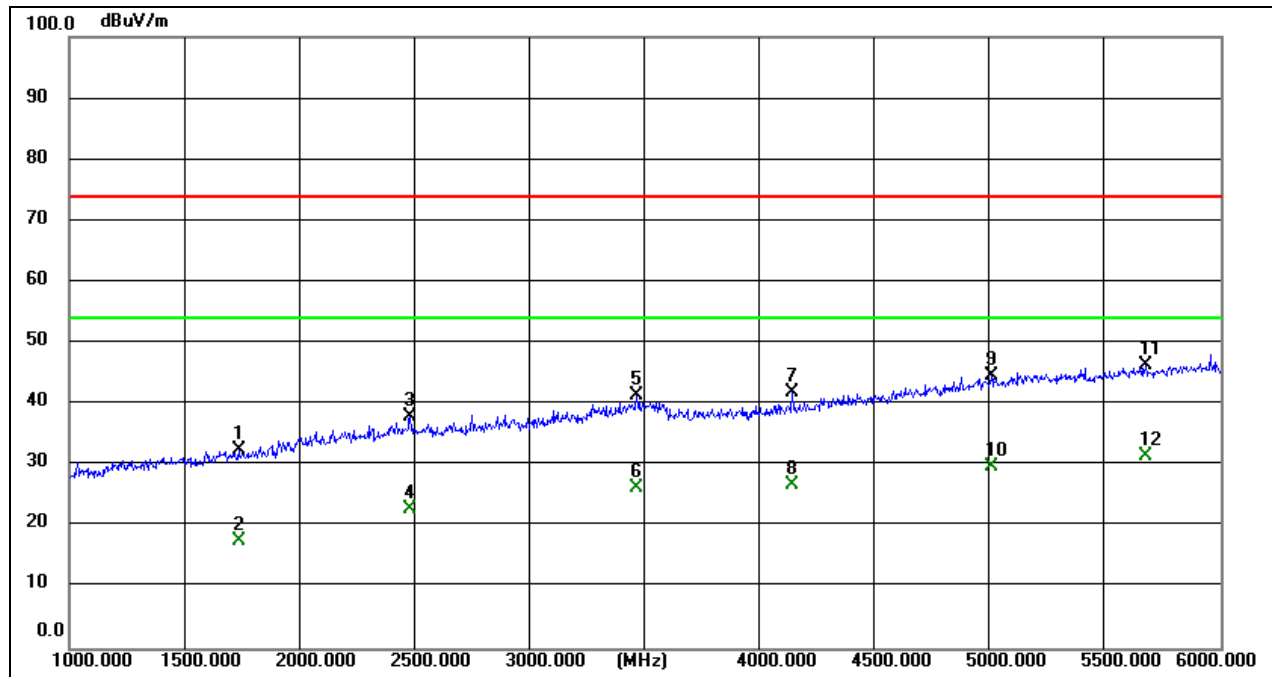
Note: All test modes had been tested, but only the worst data recorded in the report.

TEST RESULTS

Antenna: Horizontal

Mode: M01

No.	Frequency (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measurement(dBuV/m)	Limit (dBuV/m)	Over (dB)	Detect or	Comment
1	1446.500	46.57	-14.94	31.63	74.00	-42.37	peak	
2	1446.500	31.57	-14.94	16.63	54.00	-37.37	AVG	
3	1890.000	46.16	-12.29	33.87	74.00	-40.13	peak	
4	1890.000	31.16	-12.29	18.87	54.00	-35.13	AVG	
5	2515.500	47.13	-9.88	37.25	74.00	-36.75	peak	
6	2515.500	32.13	-9.88	22.25	54.00	-31.75	AVG	
7	3598.000	45.93	-4.72	41.21	74.00	-32.79	peak	
8	3598.000	30.93	-4.72	26.21	54.00	-27.79	AVG	
9	4840.000	45.54	-1.43	44.11	74.00	-29.89	peak	
10	4840.000	30.54	-1.43	29.11	54.00	-24.89	AVG	
11	5747.000	45.75	1.29	47.04	74.00	-26.96	peak	
12	5747.000	30.75	1.29	32.04	54.00	-21.96	AVG	



Antenna: Vertical

Mode: M01

No .	Frequenc y (MHz)	Reading Level(dBuV)	Correct Factor(dB/m)	Measure- ment(dBuV/m)	Limit (dBuV/m)	Over (dB)	Detect or	Commen t
1	1739.500	45.98	-13.38	32.60	74.00	-41.40	peak	
2	1739.500	30.98	-13.38	17.60	54.00	-36.40	AVG	
3	2480.000	47.89	-10.00	37.89	74.00	-36.11	peak	
4	2480.000	32.89	-10.00	22.89	54.00	-31.11	AVG	
5	3469.500	46.45	-5.06	41.39	74.00	-32.61	peak	
6	3469.500	31.45	-5.06	26.39	54.00	-27.61	AVG	
7	4141.500	45.50	-3.65	41.85	74.00	-32.15	peak	
8	4141.500	30.50	-3.65	26.85	54.00	-27.15	AVG	
9	5006.000	45.70	-0.90	44.80	74.00	-29.20	peak	
10	5006.000	30.70	-0.90	29.80	54.00	-24.20	AVG	
11	5675.000	45.39	1.07	46.46	74.00	-27.54	peak	
12	5675.000	30.39	1.07	31.46	54.00	-22.54	AVG	

Note: 1. Result = Reading +Correct (Amplifier Factor + Cable Loss + Antenna Factor)
 2. Margin = Result - Limit

8. IMMUNITY TEST

8.1. PERFORMANCE CRITERIA

EN 55035:2017/A11:2020

GENERAL PERFORMANCE CRITERIA

According to EN 55035 standard, the general performance criteria as following:

Criteria 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.
Criteria 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.
Criteria 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.

PERFORMANCE CRITERIA FOR BROADCAST RECEPTION FUNCTION

The broadcast reception function shall comply with the general performance criteria given in Clause 8 and any relevant annex with the deviations defined in Table A.2.

Table A.2 – Modified test levels for performance criterion A for the broadcast reception function			
Performance criteria	Test type table clause	Group 1	Group 2
Criterion A	1.2 1.3	The disturbance level is reduced to 1 V/m for in-band frequencies.	No test requirements apply
	2.1 3.1 4.1	The disturbance level is reduced to 1 V for in-band frequencies.	
In-band is defined as the entire tuneable operating range of the selected broadcast reception function. The tuned channel $\pm 0,5$ MHz (lower edge frequency – 0,5 MHz up to the upper edge frequency + 0,5 MHz of the tuned channel) is excluded from testing. Note: In some countries, there is a requirement to test the tuned channels. Refer to the relevant regional requirements for guidance.			

PERFORMANCE CRITERIA FOR PRINT FUNCTION

Criterion A	Refer to chapter B.3.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter B.3.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter B.3.3 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR SCAN FUNCTION

Criterion A	Refer to chapter C.3.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter C.3.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter C.3.3 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR DISPLAY AND DISPLAY OUTPUT FUNCTION

Criterion A	Refer to chapter D.3.1 and D.3.2 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter D.3.3 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter D.3.4 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR MUSICAL TONE GENERATING FUNCTION

Criterion A	Refer to chapter E.3.2 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter E.3.3 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter E.3.4 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR NETWORKING FUNCTION

General requirements for network functions	
Criterion A	Refer to chapter F.3.3.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter F.3.3.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter F.3.3.3 of EN 55035:2017/A11:2020

Requirements for CPE containing xDSL ports	
Criterion A	Refer to chapter F.4.2 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter F.4.3 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter F.4.4 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR AUDIO OUTPUT FUNCTION

Criterion A	Refer to chapter G.7.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter G.7.2 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter G.7.3 of EN 55035:2017/A11:2020

PERFORMANCE CRITERIA FOR TELEPHONY FUNCTION

Criterion A	Refer to chapter H.4 Table H.1 of EN 55035:2017/A11:2020
Criterion B	Refer to chapter H.4 Table H.1 of EN 55035:2017/A11:2020
Criterion C	Refer to chapter H.4 Table H.1 of EN 55035:2017/A11:2020

8.2. ELECTROSTATIC DISCHARGE

TEST SPECIFICATION

Standard:	EN 55035:2017/A11:2020 IEC 61000-4-2:2008
Criterion Required:	Performance criteria B
Discharge Impedance:	330(1±10 %) Ω / 150(1±10 %) pF
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Test Level:	Air Discharge: 2 kV, 4 kV, 8 kV (Direct); Contact Discharge: 4 kV (Direct/Indirect)

TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- a. Contact discharge was applied to conductive surfaces and coupling planes of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5 m x 0.5 m, is placed parallel to, and positioned at a distance 0.1 m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

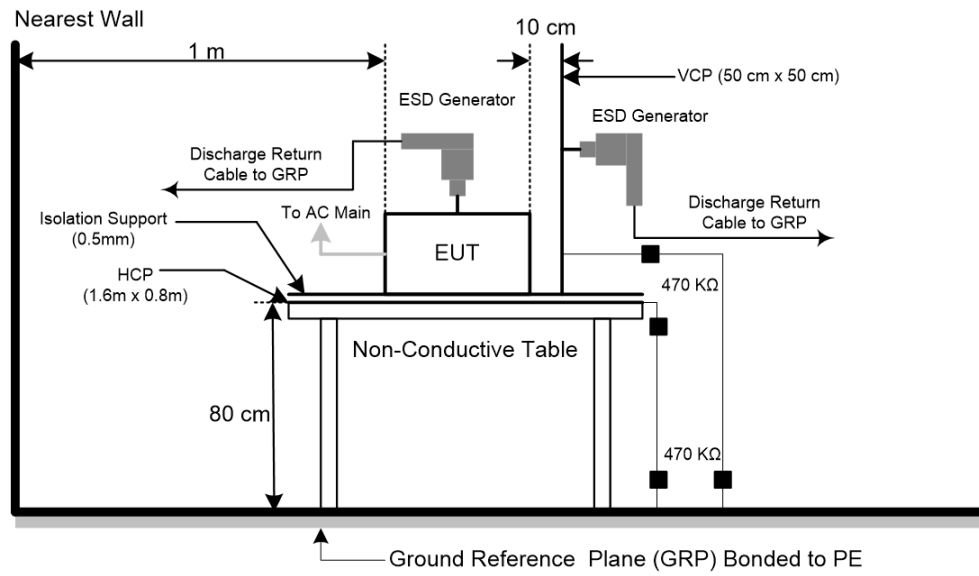
Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1 m from the EUT, with the Discharge Electrode touching the coupling plane. The four faces of the EUT will be performed with electrostatic discharge.

- b. Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

- c. The test shall be performed with single discharges. On each pre-selected point at least 10 single discharges (in the most sensitive polarity) shall be applied.
- d. For air discharge testing, the test shall be applied at all test levels 2 kV, 4 kV and 8 kV.
- e. For the actual test configuration, please refer to the related Item: EUT Test Photos.

TEST SETUP**TEST ENVIRONMENT**

Temperature	23°C	Relative Humidity	52%
Atmosphere Pressure	101kPa	Test Voltage	DC12V

TEST MODE

Test Mode:	M01
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TEST RESULTS

Mode	Level(kV)	Polarity	Test Point	Criteria	Result	Judgement
Air Discharge	2,4,8	+	All Slot	B	A	Pass
Air Discharge	2,4,8	-	All Slot	B	A	Pass
Contact Discharge	4	+	All Metal	B	A	Pass
Contact Discharge	4	-	All Metal	B	A	Pass
Horizontal Coupling	4	+	Front,rear,left,right	B	A	Pass
Horizontal Coupling	4	-	Front,rear,left,right	B	A	Pass
Vertical Coupling	4	+	Front,rear,left,right	B	A	Pass
Vertical Coupling	4	-	Front,rear,left,right	B	A	Pass
Air Discharge	15	+	All Slot	/	/	/
Air Discharge	15	-	All Slot	/	/	/
Contact Discharge	8	+	All Metal	/	/	/
Contact Discharge	8	-	All Metal	/	/	/
Observation: A: No observable change. Conclusion: The EUT met the requirements of the standard						

8.3. CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES

TEST SPECIFICATION

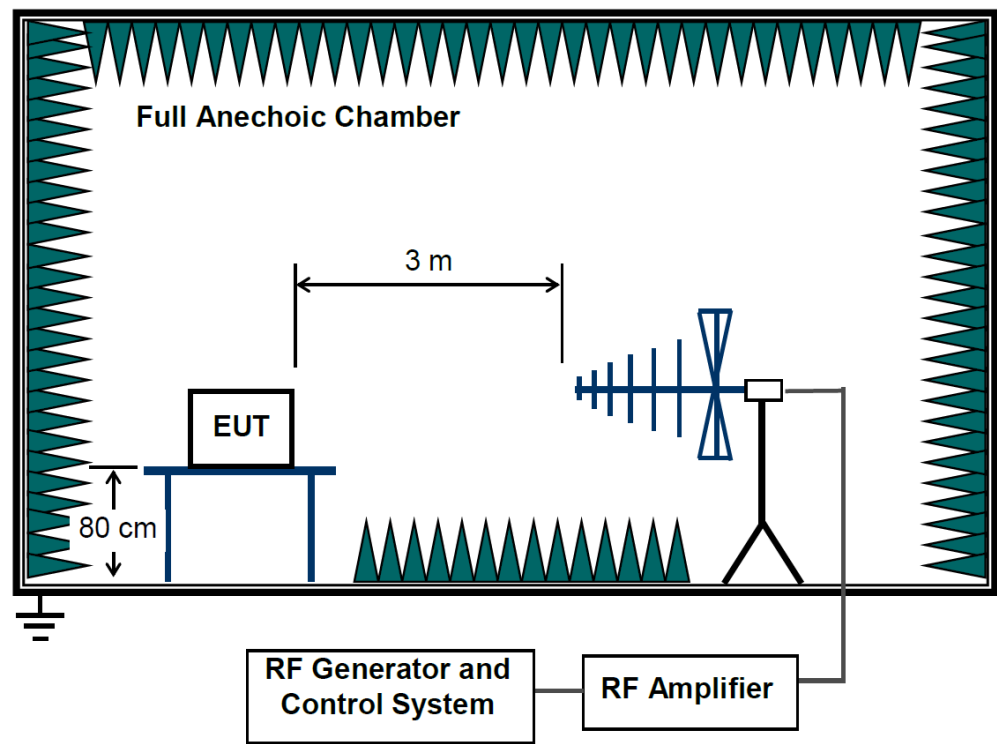
Standard:	EN 55035:2017/A11:2020 IEC 61000-4-3:2006 +A1:2007+A2:2010
Criterion Required:	Performance criteria A
Frequency range:	80 MHz - 1000MHz; 1800 MHz, 2600 MHz, 3500 MHz, 5000 MHz
Test Level:	Level 2: 3 V/m (measured unmodulated)
Modulation:	The test signal shall be amplitude modulated to a depth of 80 % by a sinusoidal audio signal of 1 000 Hz.
Frequency Step:	1 % of fundamental
Dwell time:	1 seconds
Antenna Polarization:	Horizontal and vertical

TEST PROCEDURE

The test procedure was in accordance with IEC 61000-4-3.

- a. The testing was performed in a fully anechoic chamber. The transmit antenna was located at a distance of 3 meters from the EUT.
- b. The disturbance test signal shall be 80 % amplitude modulated by a sine wave, preferably having a frequency of 1 kHz. A frequency other than 1 kHz may be used where permitted within EN 55035 (for example Clause G.3).
- c. 1 % step size is preferred, the frequency range can be swept incrementally with a step size not exceeding 4 % of the previous frequency with a test level of twice the value of the specified test level.
- d. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised and to be able to respond. However, the dwell time should not exceed 5 s at each of the frequencies during the scan.
- e. The test was performed with the EUT exposed to both vertically and horizontally polarized fields.

TEST SETUP



TEST ENVIRONMENT

Temperature	23.8℃	Relative Humidity	49%
Atmosphere Pressure	101kPa	Test Voltage	DC12V

TEST MODE

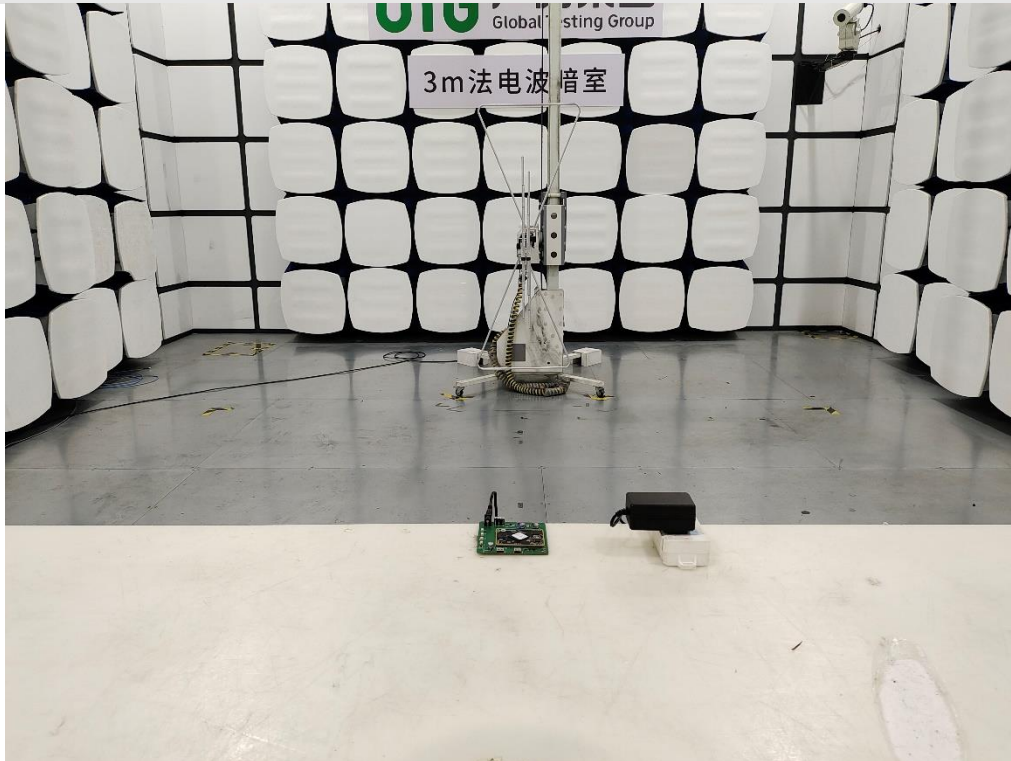
Test Mode:	M01
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TEST RESULTS

Freq.Range (MHz)	Position (Face)	Polarity (H or V)	Field Strength (V/m) (unmodulated,r.m.s)	Criterion	Result	Judgment
80-1000; 1800; 2600; 3500; 5000;	0°	H&V	3 V/m	A	A	Pass
80-1000; 1800; 2600; 3500; 5000;	90°	H&V	3 V/m	A	A	Pass
80-1000; 1800; 2600; 3500; 5000;	180°	H&V	3 V/m	A	A	Pass
80-1000; 1800; 2600; 3500; 5000;	270°	H&V	3 V/m	A	A	Pass
Observation: A: No observable change. Conclusion: The EUT met the requirements of the standard						

APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION

Radiated emissions below 1GHz



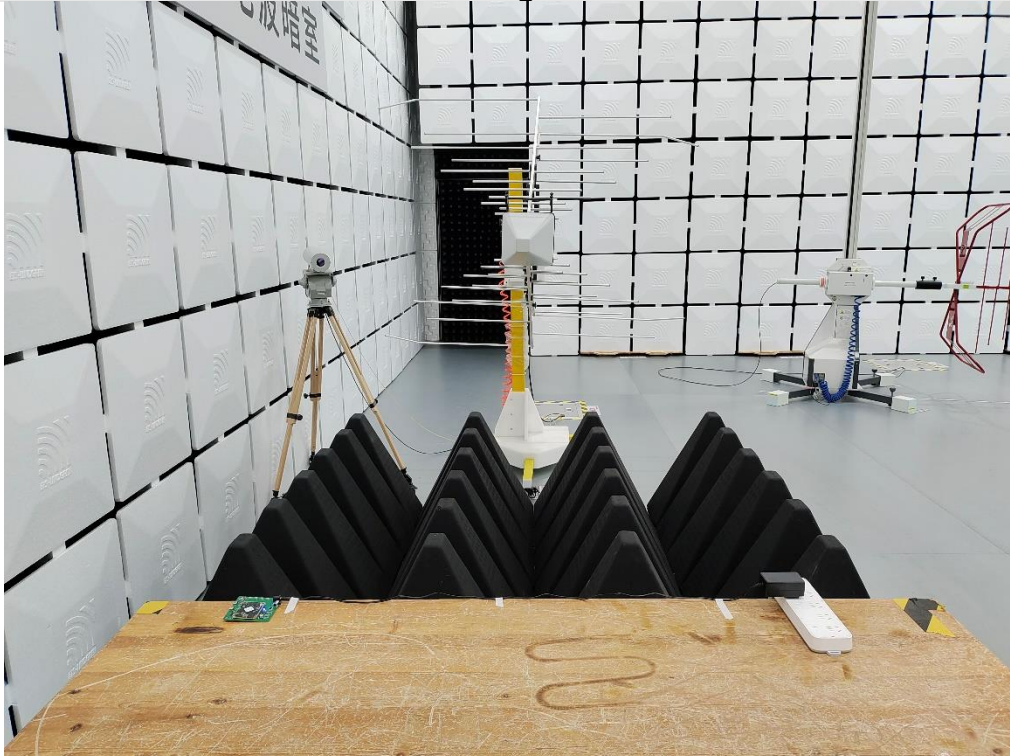
Radiated emissions above 1GHz



Electrostatic Discharge

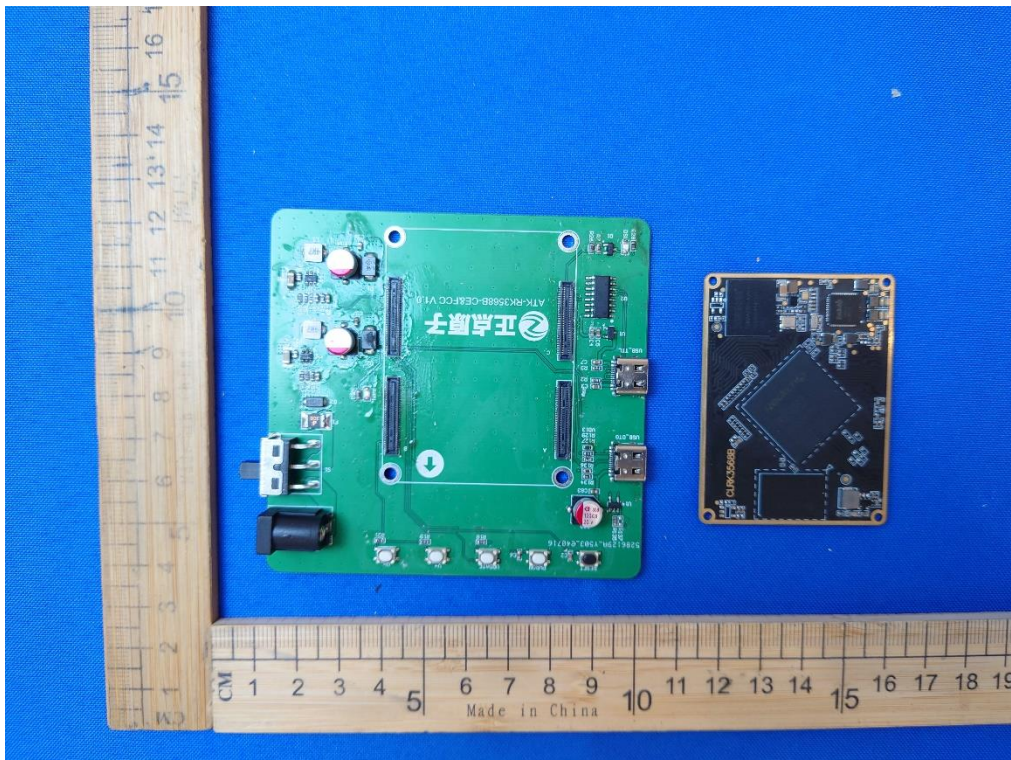
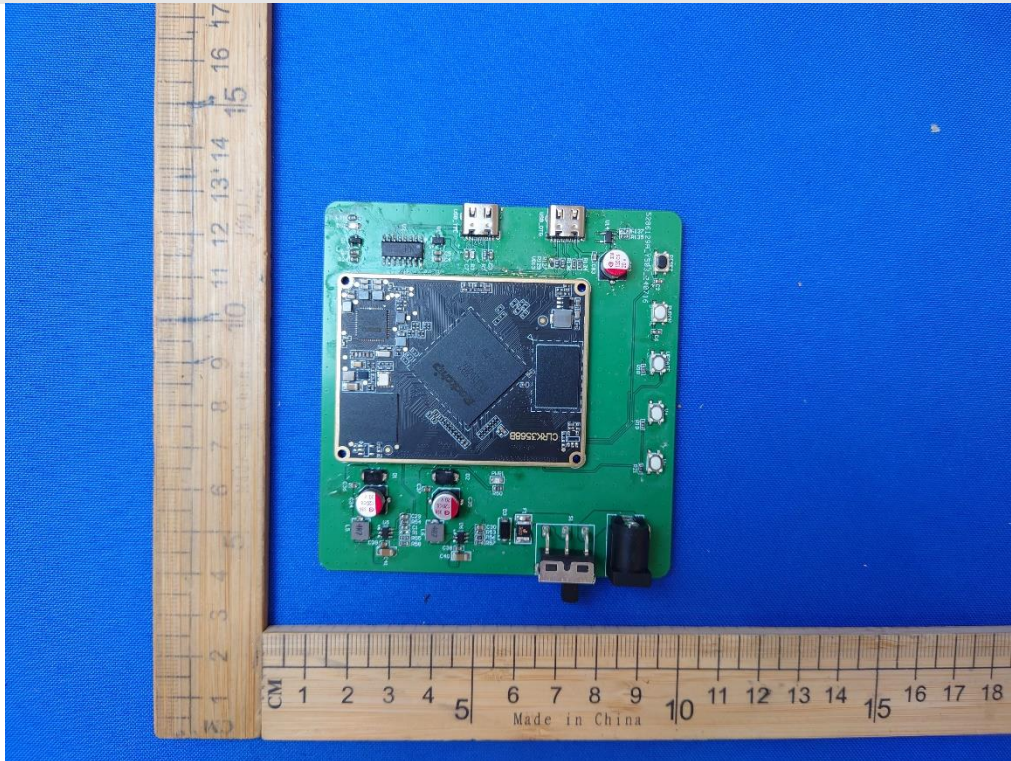


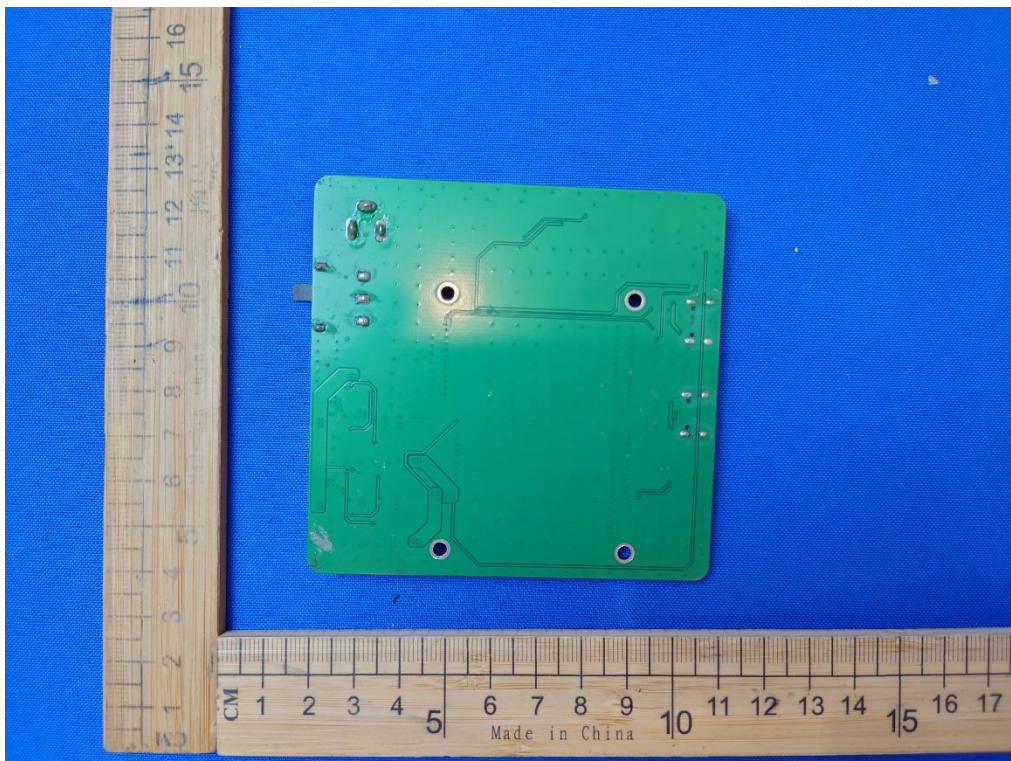
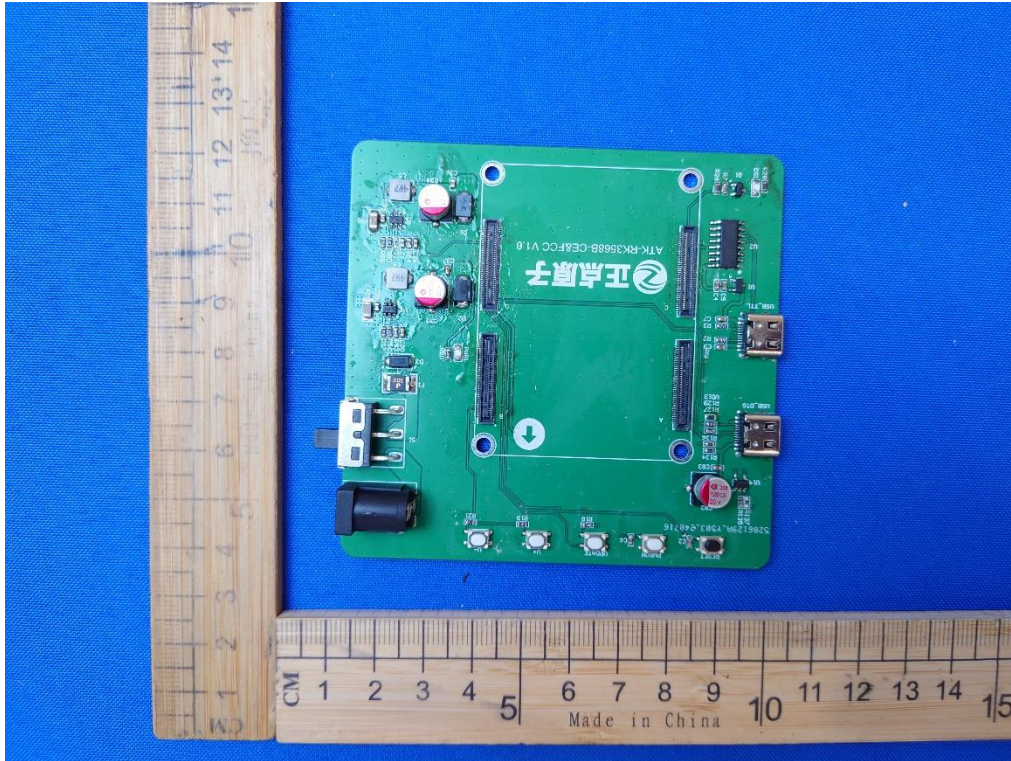
Continuous RF electromagnetic field disturbances

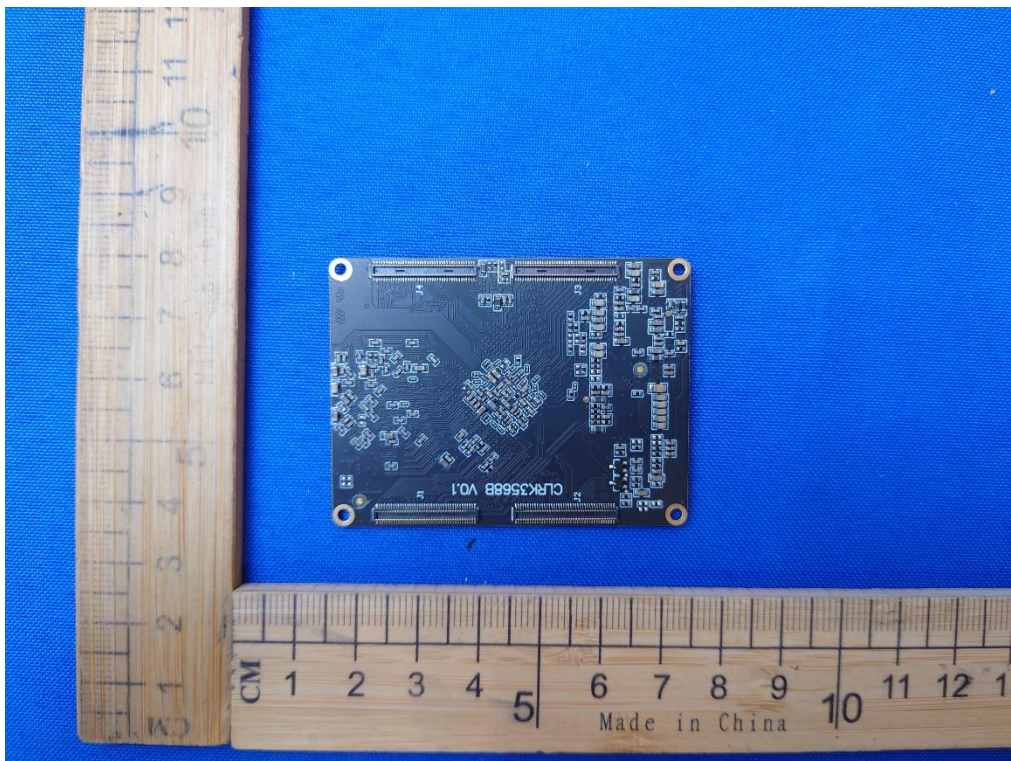
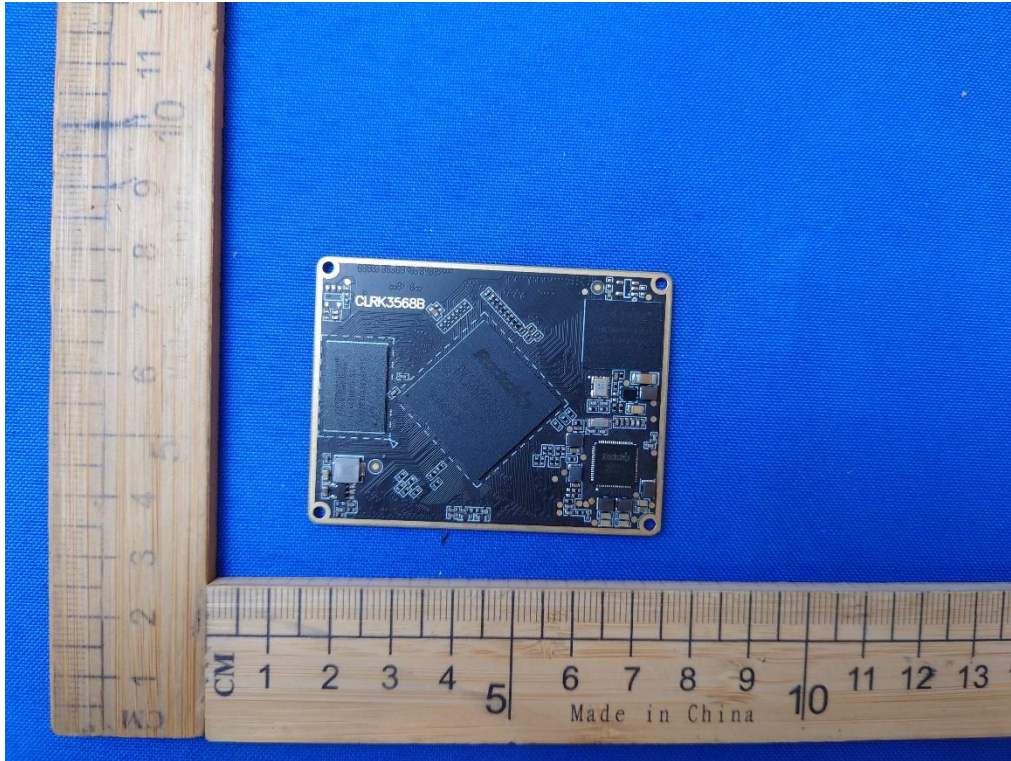


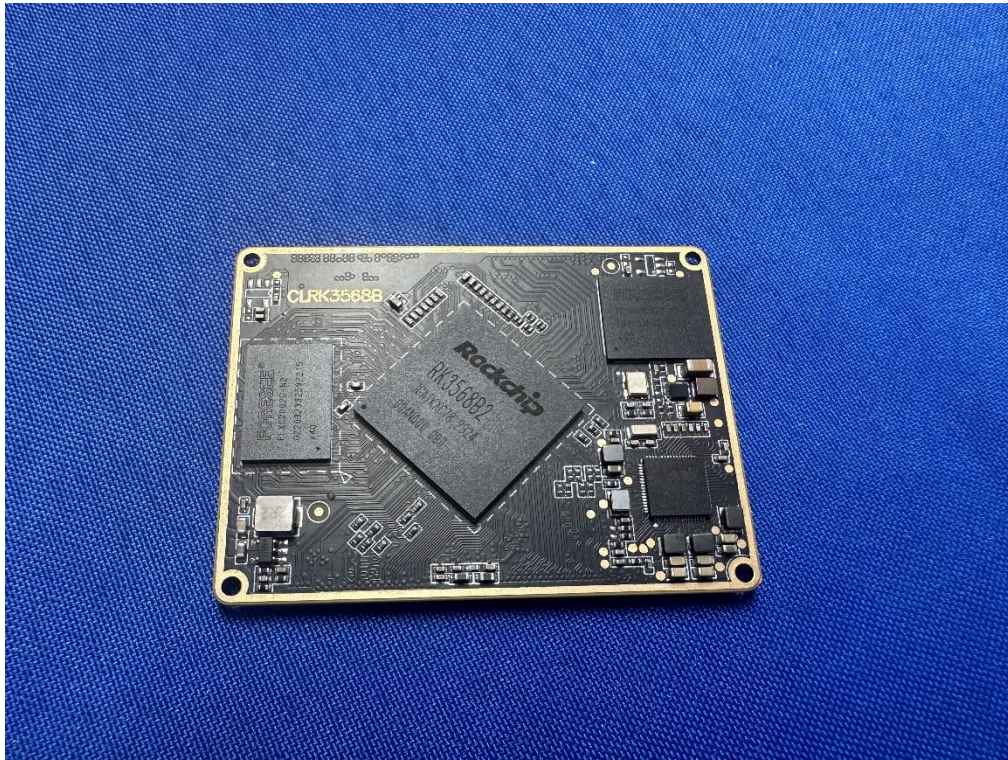
APPENDIX: PHOTOGRAPHS OF THE EUT

Internal









END OF REPORT