TEST REPORT

EN 55032 Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 55035 Information technology equipment – Immunity characteristics – Limits and methods of measurement

Report reference No.....	:	**SHUN2503044169E**
Compiled by (position+printed name+signature).....	:	File administrators Luna Ni
Supervised by (position+printed name+signature).....	:	Technique principal Allen Lin
Approved by (position+printed name+signature).....	:	Manager Ryan Du
Date of issue.....	:	Mar. 10, 2025
Testing laboratory	:	**Shenzhen Shunjin Testing Technology Co., Ltd.**
Address.....	:	A4-811, A4-812, A4-813, A4-818, Internet Era E, Ma'antang Community, Zhongxing Road, Bantian Street, Longgang District, Shenzhen, China.
Applicant.....	:	**ML Teknoloji Yazilim Donanim Ticaret Limited Sirketi**
Address.....	:	Kazimiye Mah. Goreme Sk. Derin Plaza Kat:1 No:107 Corlu / Tekirdag
Manufacturer.....	:	**ML Teknoloji Yazilim Donanim Ticaret Limited Sirketi**
Address.....	:	Kazimiye Mah. Goreme Sk. Derin Plaza Kat:1 No:107 Corlu / Tekirdag
Standard.....	:	**EN 55032:2015+A1:2020; EN 55035:2017+A11:2020 EN IEC 61000-3-2:2019+A1:2021; EN 61000-3-3:2013+A2:2021+AC:2022-01**
Non-standard test method.....	:	N/A
Type of test equipment	:	**NetRelay IoT**
Trade mark.....	:	NetRelay
Model/Type designation.....	:	NetRelay IoT DevKitV2, 8503030059
Rating.....	:	Input: 7-28V⎓1A Max. 15W, POE:DC48V
Test Date.....	:	Mar. 04, 2025 to Mar. 10, 2025
Test Results.....	:	PASS

EMC Test Report

Test Report No. :	SHUN2503044169E	Mar. 10, 2025 Date of issue

Equipment under Test	:	NetRelay IoT
Model /Type	:	NetRelay IoT DevKitV2
Listed Models	:	8503030059
Applicant	:	**ML Teknoloji Yazilim Donanim Ticaret Limited Sirketi**
Address	:	Kazimiye Mah. Goreme Sk. Derin Plaza Kat:1 No:107 Corlu / Tekirdag
Manufacturer	:	**ML Teknoloji Yazilim Donanim Ticaret Limited Sirketi**
Address	:	Kazimiye Mah. Goreme Sk. Derin Plaza Kat:1 No:107 Corlu / Tekirdag

Test Result according to the standards on page 5:	**Positive**

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.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

EN 55032:2015+A1:2020 Electromagnetic compatibility of multimedia equipment - Emission Requirements
EN 55035:2017+A11:2020 Information technology equipment – Immunity characteristics – Limits
EN IEC 61000-3-2:2019+A1:2021 Electromagnetic compatibility (EMC) -- Part 3-2: Limits - Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)
EN 61000-3-3:2013+A2:2021+AC:2022-01 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 ≤ 16 A per phase and not subject to conditional connection

2. SUMMARY

2.1. General Remarks:

Date of receipt of test sample : Mar. 04, 2025

Testing commenced on : Mar. 05, 2025

Testing concluded on : Mar. 07, 2025

2.2. Equipment Under Test

Power supply system utilised

Power supply voltage : o 230V / 50 Hz o 115V / 60Hz
o 12 V DC o 24 V DC
■ Other (specified in blank below)

DC 48V

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

The EUT is NetRelay IoT

Series number: NetRelay IoT DevKitV2

2.4. EUT operation mode:

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

The tests are carried out with surge protective devices disconnected.

Test program (customer specific)

Emissions tests……: According to EN 55032, searching for the highest disturbance.
Immunity tests ……..: According to EN 55035, searching for the highest susceptivity.
Harmonics current……. : According to EN IEC 61000-3-2, searching for the highest disturbance.
Voltage fluctuation……. : According to EN 61000-3-3, searching for the highest disturbance.

2.5. EUT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

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

■- supplied by the manufacturer

o - supplied by the lab

2.6. Performance Criteria

Definition related to the performance level:

☒ based on the used product standard
☐ based on the declaration of the manufacturer, requestor or purchaser

Criterion A:
Definition: normal performance within limits specified by the manufacturer, requestor or purchaser:

The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. 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 from what the user may reasonably expect from the apparatus if used as intended.

Criterion B:
Definition: temporary loss of function or degradation of performance which ceases after the disturbance ceases, and from which the equipment under test recovers its normal performance, without operator intervention:

The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level (or permissible loss of performance) specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however. No change of actual operating state 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 derived from the product description and documentation, and from what the user may reasonably expect from the apparatus if used as intended.

Criterion C:
Definition: temporary loss of function or degradation of performance, the correction of which requires operator intervention:

Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Shunjin Testing Technology Co., Ltd.

A4-811, A4-812, A4-813, A4-818, Internet Era E, Ma'antang Community, Zhongxing Road, Bantian Street, Longgang District, Shenzhen, China.

The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55032 requirements.

3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations: ISO 17025

3.3. Environmental conditions

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

Temperature:	22-25 ° C
Humidity:	40-54 %
Atmospheric pressure:	950-1050mbar

3.4. Test Description

Emission Measurement		
Radiated Emission	EN 55032:2015+A1:2020	PASS
Conduction Emission	EN 55032:2015+A1:2020	N/A
Harmonic Current	EN IEC 61000-3-2:2019+A1:2021	N/A
Voltage Fluctuation and Flicker	EN 61000-3-3:2013+A2:2021+AC:2022-01	N/A
Immunity Measurement		
Electrostatic Discharge	EN 55035:2017+A11:2020 EN 61000-4-2: 2009	PASS
RF Field Strength Susceptibility	EN 55035:2017+A11:2020 IEC 61000-4-3: 2020	PASS
Electrical Fast Transient/Burst Test	EN 55035:2017+A11:2020 IEC 61000-4-4: 2012	N/A
Surge Test	EN 55035:2017+A11:2020 IEC 61000-4-5:2014+A1:2017	N/A
Conducted Susceptibility Test	EN 55035:2017+A11:2020 IEC 61000-4-6:2023	N/A
Power Frequency Magnetic Field Susceptibility Test	EN 55035:2017+A11:2020 IEC 61000-4-8: 2009	N/A
Voltage Dips and Interruptions Test	EN 55035:2017+A11:2020 EN IEC 61000-4-11:2020+AC:2022-10	N/A

Remark: The test result PASS and /or FAIL has no relationship with the measurement uncertainty.

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 Shunjin Testing Technology 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 laboratory is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	±4.22dB	(1)
Conducted Emission	0.15~30MHz	±3.29dB	(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

Radiated Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA-BROADBAND ANTENNA	ROHDE & SCHWARZ	HL562	100015	2024/09
2	EMI TEST RECEIVER	ROHDE & SCHWARZ	ESI 26	100009	2024/09
3	RF TEST PANEL	ROHDE & SCHWARZ	TS / RSP	335015/ 0017	2024/09
4	TURNTABLE	ETS	2088	2149	2024/09
5	ANTENNA MAST	ETS	2075	2346	2024/09
6	EMI TEST SOFTWARE	ROHDE & SCHWARZ	ESK1	N/A	2024/09

Conducted Emission					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100038	2024/09
2	Artificial Mains	ROHDE & SCHWARZ	ESH2-Z5	100028	2024/09
3	Pulse Limiter	ROHDE & SCHWARZ	ESHSZ2	100044	2024/09
4	EMI Test Software	ROHDE & SCHWARZ	ESK1	N/A	2024/09

Harmonic Current					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Purified Power Source	CALIFORNIA INSTRUMENTS	HFS500	54513	2024/09
2	Harmonic And Flicker Analyzer	EM TEST	DPA503S1	0500-10	2024/09

Voltage Fluctuation and Flicker					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Purified Power Source	CALIFORNIA INSTRUMENTS	HFS500	54513	2024/09
2	Harmonic And Flicker Analyzer	EM TEST	DPA503S1	0500-10	2024/09

Electrostatic Discharge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ESD Simulator	EM TEST	DITOC0103Z	0301-04	2024/09

RF Field Strength Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	SIGNAL GENERATOR	IFR	2032	203002/100	2024/09
2	AMPLIFIER	AR	150W1000	301584	2024/09
3	DUAL DIRECTIONAL COUPLER	AR	DC6080	301508	2024/09
4	POWER HEAD	AR	PH2000	301193	2024/09
5	POWER METER	AR	PM2002	302799	2024/09

Electrical Fast Transient/Burst					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultra Compact Simulator	EM TEST	UCS500M6	0500-19	2024/09

Surge					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA COMPACT SIMULATOR	EM TEST	UCS500M6	0500-19	2024/09

Conducted Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Signal Generator	IFR	2023A	202304/060	2024/09
2	Amplifier	AR	75A250	302205	2024/09
3	Dual Directional Coupler	AR	DC2600	302389	2024/09
4	6db Attenuator	EMTEST	ATT6/75	0010230A	2024/09
5	EM CLAMP	LÜTHI	EM101	335625	2024/09
6	CDN	EMTEST	CDN M3	0802-03	2024/09

Power Frequency Magnetic Field Susceptibility					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	ULTRA COMPACT SIMULATOR	EM TEST	UCS500M6	202304/060	2024/09
2	MOTOR DRIVEN VOLTAGE TRANSFORMER	EM TEST	MV2616	302205	2024/09
3	CURRENT TRANSFORMER	EM TEST	MC2630	302389	2024/09
4	MAGNETIC COIL	EM TEST	MS100	0010230A	2024/09

Voltage Dips and Interruptions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.
1	Ultra Compact Simulator	EM TEST	UCS500M6	0500-19	2024/09
2	Motor Driven Voltage Transformer	EM TEST	MV2616	0301-11	2024/09

4. TEST CONDITIONS AND RESULTS

4.1. Radiated Emission

For test instruments and accessories used see section 3.6.

4.1.1. Description of the test location

Test location: Shielded room No. 2

4.1.2. Limits of disturbance(EN55032 B)

Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dBμV/m)
30 ~ 230	3	40
230 ~ 1000	3	47

Note: (1) The tighter limit shall apply at the edge between two frequency bands.

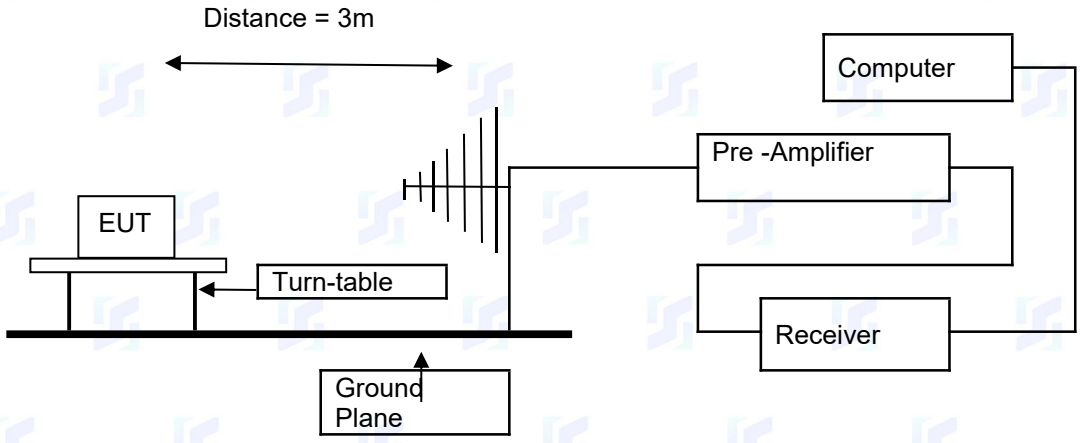
(2) Distance refers to the distance in meters between the test instrument antenna and the closest point of any part of the E.U.T.

4.1.3. Description of the test set-up

4.1.3.1. Operating Condition

The EUT is set to work shall be carried out with full load mode during the test, and the maximum emanating results are recorded.

4.1.3.2. Configuration of test setup



4.1.4. Test result

The requirements are **Fulfilled**

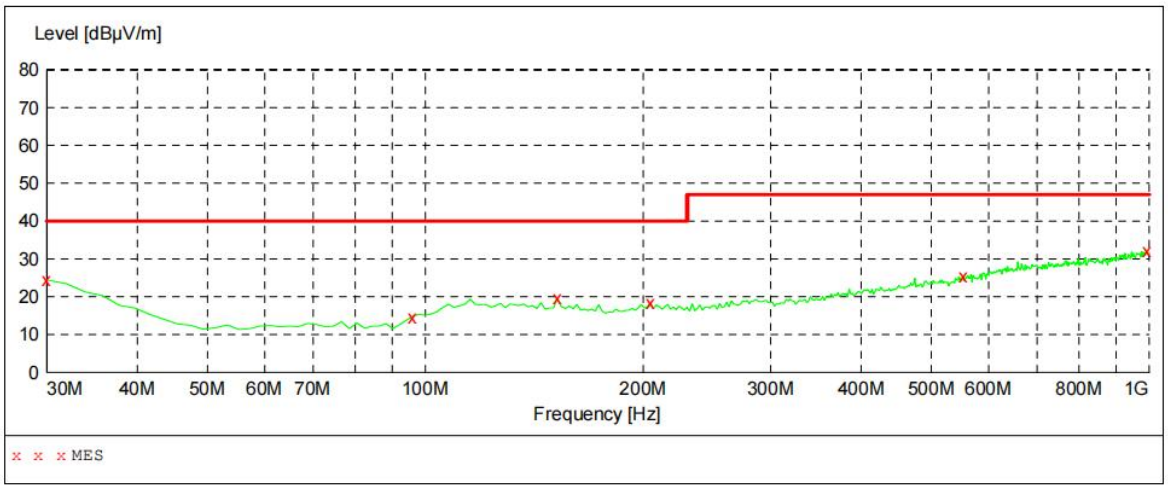
Band Width: 120KHz

Frequency Range: 30MHz to 1000MHz

Remarks: The limits are kept. For detailed results, please see the following page(s).

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1

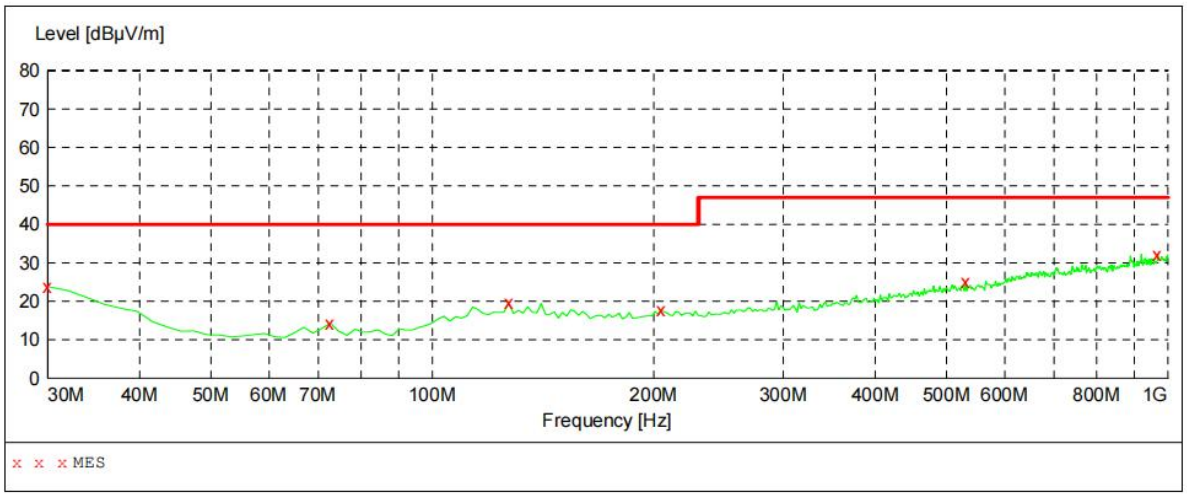


MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	24.40	21.1	40.0	15.6	---	0.0	0.00	HORIZONTAL
95.960000	14.70	10.6	40.0	25.3	---	0.0	0.00	HORIZONTAL
152.220000	19.60	14.1	40.0	20.4	---	0.0	0.00	HORIZONTAL
204.600000	18.50	14.4	40.0	21.5	---	0.0	0.00	HORIZONTAL
553.800000	25.50	21.1	47.0	21.5	---	0.0	0.00	HORIZONTAL
994.180000	32.00	27.3	47.0	15.0	---	0.0	0.00	HORIZONTAL

SWEEP TABLE: "test (30M-1G)"

Short Description:			Field Strength		
Start Frequency	Stop Frequency	Detector	Meas. Time	IF Bandw.	Transducer
30.0 MHz	1.0 GHz	MaxPeak	300.0 ms	120 kHz	JB1



MEASUREMENT RESULT:

Frequency MHz	Level dBµV/m	Transd dB	Limit dBµV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	23.80	21.1	40.0	16.2	---	0.0	0.00	VERTICAL
72.680000	14.30	8.5	40.0	25.7	---	0.0	0.00	VERTICAL
127.000000	19.60	15.0	40.0	20.4	---	0.0	0.00	VERTICAL
204.600000	17.80	14.4	40.0	22.2	---	0.0	0.00	VERTICAL
530.520000	25.10	20.5	47.0	21.9	---	0.0	0.00	VERTICAL
968.960000	32.30	26.9	47.0	14.7	---	0.0	0.00	VERTICAL

4.2. Conducted disturbance

The test is not applicable.

4.3. Harmonic current

The test is not applicable.

4.4. Voltage Fluctuation and Flicker

The test is not applicable.

4.5. Electrostatic discharge

For test instruments and accessories used see section 3.6.

4.5.1. Description of the test location and date

Test location: Shielded room No. 3

Date of test: Mar. 05, 2025

Operator: Allen Lin

4.5.2. Severity levels of electrostatic discharge

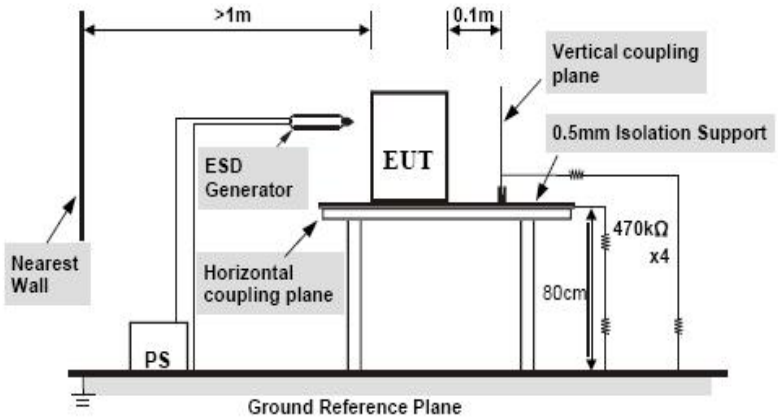
Level	Test Voltage Contact Discharge (KV)	Test Voltage Air Discharge (KV)
1	2	2
2	4	4
3	6	8
4	8	15
X	Special	Special

4.5.3. Description of the test set-up

4.5.3.1. Operating Condition

The EUT is set to work shall be carried out with normal working mode during the test, and the maximum emanating results are recorded.

4.5.3.2. Configuration of test setup



4.5.4. Test specification:

Contact discharge voltage:	■ 2 kV	■ 4 kV	
Air discharge voltage:	■ 2 kV	■ 4 kV	■ 8 kV
Number of discharges:	☐ ≥ 10	■ ≥ 25	
Type of discharge:	Direct discharge	■ Air discharge ■ Contact discharge	
	Indirect discharge	■ Contact discharge	
Polarity:	■ Positive	■ Negative	
Discharge location:	■ see photo documentation of the test set-up		
	■ all external locations accessible by hand		
	■ horizontal plate (HCP)		
	■ vertical coupling plate (VCP)		

4.5.5. Test result

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

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.6. Radiated, radio-frequency, electromagnetic field

For test instruments and accessories used see section 3.6.

4.6.1. Description of the test location and date

Test location: Shielded room No. 2

Date of test: Mar. 05, 2025

Operator: Allen Lin

4.6.2. Severity levels of radiated, radio-frequency, electromagnetic field

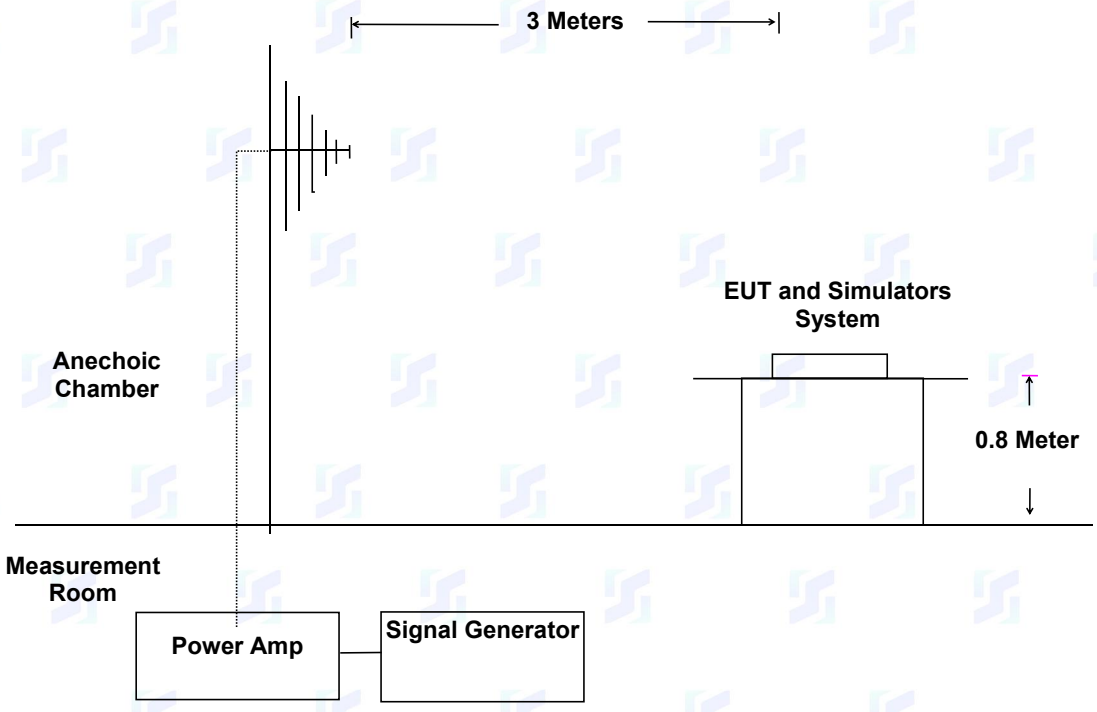
Level	Field Strength (V/m)
1.	1
2.	3
3.	10
X	Special

4.6.3. Description of the test set-up

4.6.3.1. Operating Condition

The EUT is set to work shall be carried out normal working mode during the test, and the maximum emanating results are recorded.

4.6.3.2. Configuration of test setup



4.6.4. Test specification:

Frequency range:	■ 110MHz to 205 MHz
Field strength:	■ 3 V/m
EUT - antenna separation:	■ 3 m
Modulation:	■ AM: 80 % ■ sinusoidal 1000Hz
Frequency step:	■ 1 % with 3 s dwell time
Antenna polarisation:	■ horizontal ■ vertical

4.6.5. Test result

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

Remarks: During the test no deviation was detected to the selected operation mode(s).

4.7. Electrical fast transients / Burst

The test is not applicable.

4.8. Surge

The test is not applicable.

4.9. Conducted disturbances induced by radio-frequency fields

The test is not applicable.

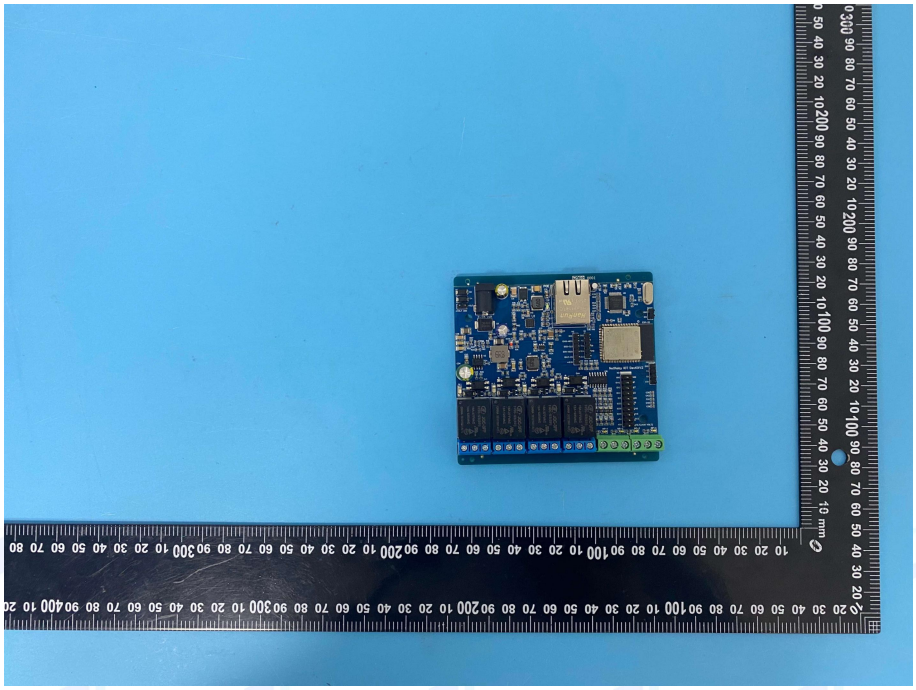
4.10. Magnetic Field Immunity

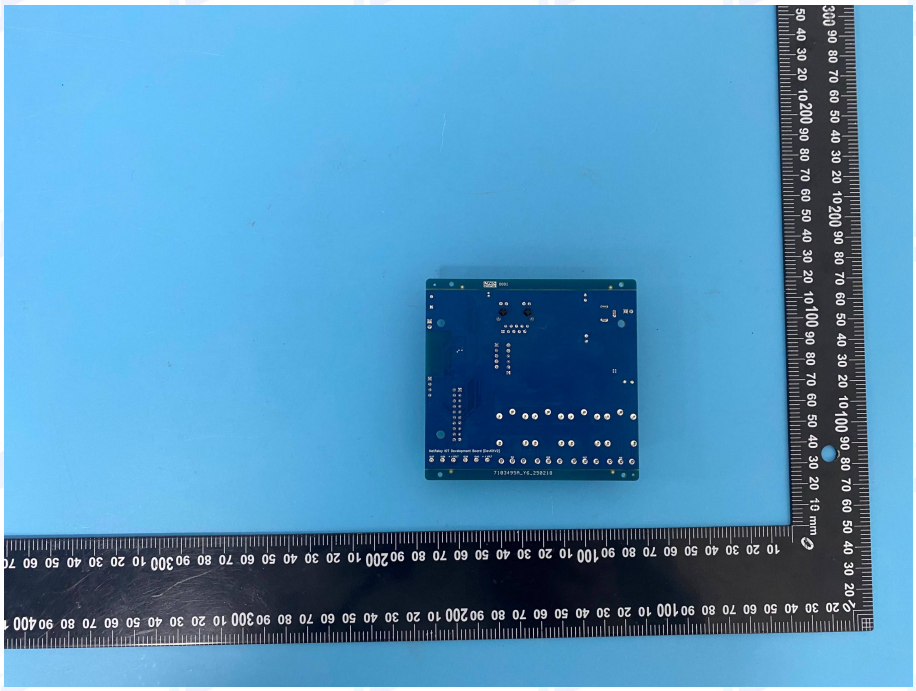
The test is not applicable.

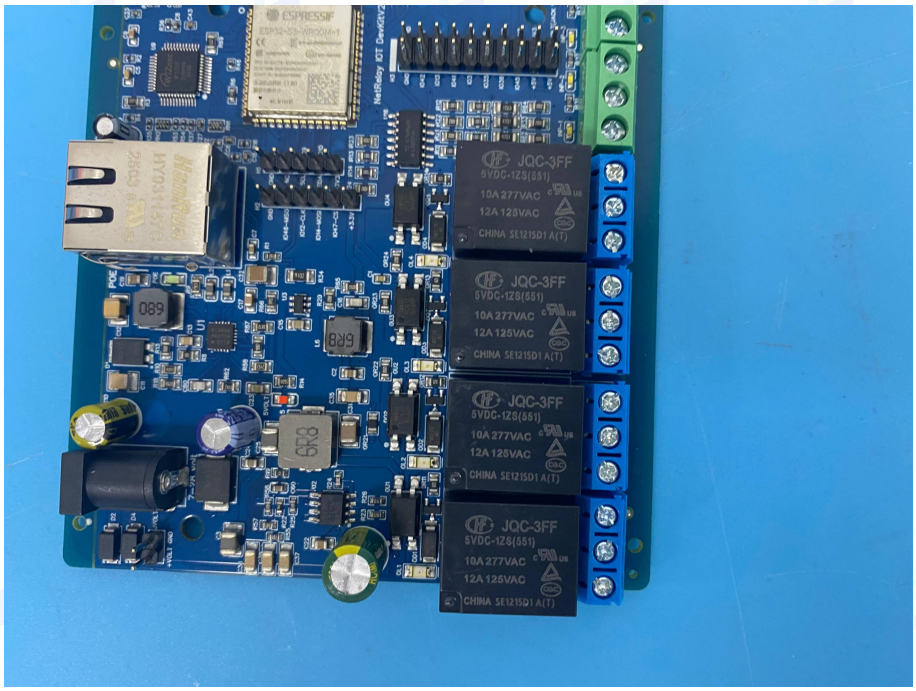
4.11. Voltage Dips and Interruptions

The test is not applicable.

5. Photos of the EUT






JQC-3FF
5VDC-1ZS(551)
10A 277VAC
12A 125VAC
CHINA SE1215D1 A(T)

****Modified History****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	2025/03/10	Luna Ni

.....End of report.....