



EMC TEST REPORT

For

DexForce Technology Co., Ltd.

DexSense 3D industrial camera

Test Model: DF-XEMA-L-1803

Additional Models : please refer to Model list

Prepared for : DexForce Technology Co., Ltd.
Address : Room 512, Building 4, Software Industry Base, No. 19, 17, 18,
Haitian First Road, BinhaiCommunity, Yuehai Street, Nanshan
District, Shenzhen

Prepared by : Shenzhen Southern LCS Compliance Testing Laboratory Ltd.
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Date of receipt of test sample : April 13, 2023
Number of tested samples : 1
Serial number : Prototype
Date of Test : April 13, 2023 - April 21, 2023
Date of Report : April 21, 2023



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**EMC TEST REPORT****EN 55032:2015+A1:2020**

Electromagnetic compatibility of multimedia equipment - Emission requirements

EN 55035:2017+A11:2020

Electromagnetic compatibility of multimedia equipment - Immunity requirements

Report Reference No LCSB032023107E

Date of Issue: April 21, 2023

Testing Laboratory Name Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Address: 101-201, No.39 Building, Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China.

Testing Procedure: Full application of Harmonised standards ☒
Partial application of Harmonised standards ☐
Other standard testing method ☐**Applicant's Name** DexForce Technology Co., Ltd.

Address: Room 512, Building 4, Software Industry Base, No. 19, 17, 18, Haitian First Road, Binhai Community, Yuehai Street, Nanshan District, Shenzhen.

Test Specification:Standard: EN 55032:2015+A1:2020
EN 55035:2017+A11:2020
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021

Test Report Form No.: SLCSEMC-2.3

TRF Originator: Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

Master TRF: Dated 2016-08

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Equipment Under Test..... DexSense 3D industrial cameraTrademark.....: 

Test Model/Type: DF-XEMA-L-1803

Rating.....: See Model List

Results PASS**Compiled by:****Supervised by:****Approved by:**

Ella Huang / Engineer

Amy Liu / Technique Director

Dm Gu / Manager



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EMC - TEST REPORT

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The applicant and manufacturer information, product name, model, trademark and other information in this report are all provided by the applicant, and this laboratory is not responsible for verifying its authenticity.

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.



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ENVIRONMENTAL CONDITIONS

The climatic conditions during the test are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. the climatic conditions during the test were in the following Limits:

Ambient temperature	15°C - 30°C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa - 106 kPa

Climate values will be recorded and recorded separately if specifically required in the base standard or application product/product series standard.

POSSIBLE TEST CASE VERDICTS

Test cases does not apply to test object	N/A
Test object does meet requirement	P(Pass) / PASS
Test object does not meet requirement	F(Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

☒ Indicate that the conditions, standards or equipment listed is applicable to this report / test / EUT.
☐ Indicate that the conditions, standards or equipment listed is not applicable to this report / test / EUT.

REVISION HISTORY

Revision	Issue Date	Revision Content	Revised by
000	April 21, 2023	Initial Issue	-

Remark:
000) : “---”





TABLE OF CONTENTS

1. GENERAL INFORMATION	6
1.1. General Description of The Item(s)	6
1.2. Operating Mode(s) Used of Tests	7
1.3. Support / Auxiliary Equipment For The EUT	7
1.4. Description of Test Facility	7
2. STATEMENT OF THE MEASUREMENT UNCERTAINTY	8
3. MEASURING DEVICES AND TEST EQUIPMENT	9
4. VERDICT SUMMARY SECTION	11
4.1. Standard(s)	11
4.2. Overview of Results	12
5. EMISSION TESTS	13
5.1. Conducted Disturbance	13
5.2. Radiated Disturbance	15
5.3. Harmonic Current	17
5.4. Voltage Fluctuations & Flicker	18
6. IMMUNITY TESTS	19
6.1. Performance Criteria	19
6.2. Electrostatic Discharge	20
6.3. Radio-Frequency Electromagnetic Fields	21
6.4. Electrical Fast Transient / Burst	22
6.5. Continuous Induced RF Disturbances	23
6.6. Surge	24
6.7. Voltage Dips and Short Interruptions	25
6.8. Power Frequency Magnetic Field	26
ANNEX A - TEST RESULTS	27
ANNEX B - TEST PHOTOS	39
ANNEX C - EXTERNAL AND INTERNAL PHOTOS OF THE EUT	44





1. GENERAL INFORMATION

1.1. GENERAL DESCRIPTION OF THE ITEM(S)

Equipment Under Test	DexSense 3D industrial camera
Test Model/Type	DF-XEMA-L-1803
Additional Models/Type	See Model List
Description of Model difference	See Model List
Rating	See Model List
Classification of equipment	☐ Class A ☒ Class B
Highest internal frequency (Fx)	≤ 108 MHz

Information of the Equipment Under Test(EUT)

Model List:

Declared by applicant as follows:

- All models of drives use the same circuit and PCB layout.
- All models have similar appearance and structure except dimension.
- This report after information review and verification, the model “DF-XEMA-L-1803” were chosen as the representative model to perform all the tests.

Model	Rating	Dimension(mm)
DF-XEMA-L-1803	Input: AC100-240V, 50/60Hz, 1.6A, Max; 76.8W Output: DC24V, 3.2A	433x133x51
DF-XEMA-L-1805		
DF-XEMA-L-1806		
DF-XEMA-P-1201		126x146x61
DF-XEMA-P-1202		
DF-XEMA-P-1203		
DF-XEMA-S-806-F80		207x1227.5x50.5
DF-XEMA-S-806		
DF-XEMA-S-808		
DF-XEMA-S-809		

for more information refer to client's DoC letter.





1.2. OPERATING MODE(S) USED OF TESTS

During the tests, the following operating mode(s) has(have) been used.

Operating Mode	Operating Mode description	Used for testing	
		Emission	Immunity
1	Normal operation	☒	☒
2	Bluetooth	☐	☐
3	HDMI	☐	☐
4	Full load	☐	☐

1.3. SUPPORT / AUXILIARY EQUIPMENT FOR THE EUT

EUT has been tested using the following auxiliary equipment :

Auxeq	Model/Type	Manufacturer	Supplied by
--			

1.4. DESCRIPTION OF TEST FACILITY

Test Location 1	Shenzhen Southern LCS Compliance Testing Laboratory Ltd. 101-201, No.39 Building,Xialang Industrial Zone, Heshuikou Community, Matian Street, Guangming District, Shenzhen, China. CNAS Registration Number is L10160.
Test Location 2	Shenzhen LCS Compliance Testing Laboratory Ltd. 101, 201 Building A and 301 Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, Guangdong, China. NVLAP Accreditation Code is 600167-0. CNAS Registration Number is L4595.
Date of receipt of test item	April 13, 2023
Date(s) of performance of test	April 13, 2023 - April 21, 2023

Note: Radio-Frequency Electromagnetic Field (RS) Test Subcontract to Shenzhen LCS Compliance Testing Laboratory Ltd for Testing.





2. 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 LCS 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.

Measurement	Uncertainty (U_{lab})	Uncertainty (U_{cisp})
Conducted disturbance (150kHz - 30MHz)	± 2.80 dB	± 3.6 dB
Radiated disturbance (30MHz - 200MHz)	± 4.66 dB	± 5.2 dB
Radiated disturbance (200MHz - 1GHz)	± 4.64 dB	± 5.0 dB

Supplementary information:

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor of $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.





3. MEASURING DEVICES AND TEST EQUIPMENT

CONDUCTED DISTURBANCE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Receiver	R&S	ESCI	101142	2022-05-05	2023-05-04
2	10dB Attenuator	SCHWARZBECK	VTSD9561-F	9561-F159	2022-05-05	2023-05-04
3	Artificial Mains Network	SCHWARZBECK	NSLK8127	8127716	2022-05-05	2023-05-04
4	EMI Test Software	EZ	EZ EMC	N/A	/	/
5	Asymmetric Artificial Network	SCHWARZBECK	NTFM 8158	NTFM8158#120	2022-05-05	2023-05-04
6	Voltage Probe	SCHWARZBECK	KT 9420	9420401	2022-05-05	2023-05-04
7	No. 2 shielded Room	CHENGYU	843	/	2020-06-16	2023-06-16

RADIATED DISTURBANCE (above 30MHz)						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	2021-06-15	2024-06-15
2	EMI Test Receiver	R&S	ESCI3	101010	2022-05-05	2023-05-04
3	Log-periodic Antenna	SCHWARZBECK	VULB9163	5094	2022-05-08	2025-05-07
4	Coupling Decoupling Network	SCHWARZBECK	CDNE M2	00251	2022-10-13	2023-10-12
5	Coupling Decoupling Network	SCHWARZBECK	CDNE M3	00248	2022-10-13	2023-10-12
6	EMI Test Software	EZ	EZ EMC	N/A	/	/
7	Controller system	KGS	M4U450	/	/	/

HARMONIC CURRENT & FLICKER						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Harmonic Current And Flicker Test System	HTEC	AC2000A	/	2022-05-05	2023-05-04
2	Linear Variable Frequency Power Supply	HTEC	HHF-5010	/	2022-05-05	2023-05-04

ELECTROSTATIC DISCHARGE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	TESEQ	NSG 437	1615	2023-03-20	2024-03-19

ELECTRICAL FAST TRANSIENT / BURST						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Electrical Fast Transient Generator	HTEC	HEFT51	162201	2022-05-05	2023-05-04
2	Coupling Clamp	HTEC	H3C	163701	2022-05-05	2023-05-04

SURGE						
Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Surge Generator	3CTEST	SG5006G	EC5581070	2022-05-05	2023-05-04
2	Coupling / decoupling Network	3CTEST	SGN-5010G	EC5591033	2022-05-05	2023-05-04



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**INJECTED CURRENTS (RADIO-FREQUENCY COMMON MODE)**

Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Conducted Susceptibility Generator	HTEC	CDG6000	126A140012016	2022-05-05	2023-05-04
2	Coupling Network	HTEC	CDN-M2+M3	A22/0382/2016	2022-05-05	2023-05-04
3	Attenuator 6dB	HTEC	ATT6	HA1601	2022-05-05	2023-05-04
4	Electromagnetic clamp	LUTHI	EM101	35535	2022-05-05	2023-05-04

POWER FREQUENCY MAGNETIC FIELD

Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Power Frequency Mag-Field Generator System	HTEC	HPFMF100	100-2400	2022-05-05	2023-05-04

VOLTAGEDIPS AND SHORT INTERRUPTIONS

Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Voltage Dips and up Generator	HTEC	HPFS161P	162202	2022-05-05	2023-05-04

RADIO-FREQUENCY ELECTROMAGNETIC FIELDS

Item	Test equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESG Vector Signal Generator	Agilent	E4438C	MY42081396	2022-06-06	2023-06-05
2	RF POWER AMPLIFIER	OPHIR	5225R	1052	2022-06-16	2023-06-15
3	RF POWER AMPLIFIER	OPHIR	5273F	1019	2022-06-16	2023-06-15
4	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	2022-06-19	2023-06-18
5	Stacked Mikrowellen Log.-Per Antenna	SCHWARZBECK	STLP 9149	9149-484	2022-06-19	2023-06-18
6	Electric field probe	Narda S.TS./PMM	EP601	611WX80208	2022-06-06	2023-06-05



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4. VERDICT SUMMARY SECTION

This chapter present an overview of the standards and results. Refer the next chapter for details of measured test results and applied test levels.

4.1. STANDARD(S)

EN 55032:2015+A1:2020 - Electromagnetic compatibility of multimedia equipment - Emission requirements.

EN 55035:2017+A11:2020 - Electromagnetic compatibility of multimedia equipment - Immunity requirements.

EN IEC 61000-3-2:2019+A1:2021 - Electromagnetic compatibility (EMC) Part 3-2: Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).

EN 61000-3-3:2013+A1:2019+A2:2021 - Electromagnetic compatibility (EMC) Part 3-3: Limits for 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.



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4.2. OVERVIEW OF RESULTS

EMISSION TESTS - EN 55032, EN IEC 61000-3-2, EN 61000-3-3		
Requirement - Test case	Limit	Verdict
Conducted Disturbance - AC mains power ports	Table A.9, Table A.10	PASS
Conducted Disturbance - Asymmetric mode	Table A.11, Table A.12	N/A
Assessment of the enclosure port	---	---
Radiated Disturbance in the frequency range 30 MHz to 1 GHz	Table A.2, Table A.4	PASS
Radiated Disturbance in the frequency range Above 1 GHz	Table A.3, Table A.5	N/A
Harmonic Current	Clause 7	N/A
Voltage Fluctuations and Flicker	Clause 5	PASS
IMMUNITY TESTS - EN 55035		
Requirement - Test case	Basic Standard(s)	Verdict
Electrostatic Discharge	IEC/EN 61000-4-2	PASS
Radio-Frequency Electromagnetic Fields	IEC/EN 61000-4-3	PASS
Electrical Fast Transient / Burst	IEC/EN 61000-4-4	PASS
Surge	IEC/EN 61000-4-5	PASS
Continuous induced RF disturbances	IEC/EN 61000-4-6	PASS
Power Frequency Magnetic Field	IEC/EN 61000-4-8	PASS
Voltage Dips and Short Interruptions	IEC/EN 61000-4-11	PASS

Supplementary information : ---





5. EMISSION TESTS

5.1. CONDUCTED DISTURBANCE

Standard	EN 55032:2015+A1:2020
Basic Standard(s)	EN 55016-2-1

Disturbance voltage limits at AC mains power ports of Class B equipment

Frequency range [MHz]	Limit: Quasi-peak [dB(μV)]	Limit: Average[dB(μV)]	IF BW
0,15 - 0,5	66 - 56	56 - 46	9 kHz
0,5 - 5,0	56	46	
5,0 - 30	60	50	
1) At the transition frequency, the lower limit applies.			

Disturbance voltage limits at AC mains power ports of Class A equipment

Frequency range [MHz]	Limit: Quasi-peak [dB(μV)]	Limit: Average[dB(μV)]	IF BW
0,15 - 0,5	79	66	9 kHz
0,5 - 30	73	60	
1) At the transition frequency, the lower limit applies.			

Disturbance voltage / Current limits at Asymmetric mode of Class B equipment

Frequency range [MHz]	Coupling device	Limit: Quasi-peak [dB(μV/A)]	Limit: Average [dB(μV/A)]	IF BW
0,15 - 0,5	ANN	84 - 74	74 - 64	9 kHz
0,5 - 30		74	64	
0,15 - 0,5	Voltage Probe	84 - 74	74 - 64	
0,5 - 30		74	64	
0,15 - 0,5	Current Probe	40 - 30	30 - 20	
0,5 - 30		30	20	
1) Applicable to intended to connect to cables longer than 3 m.				

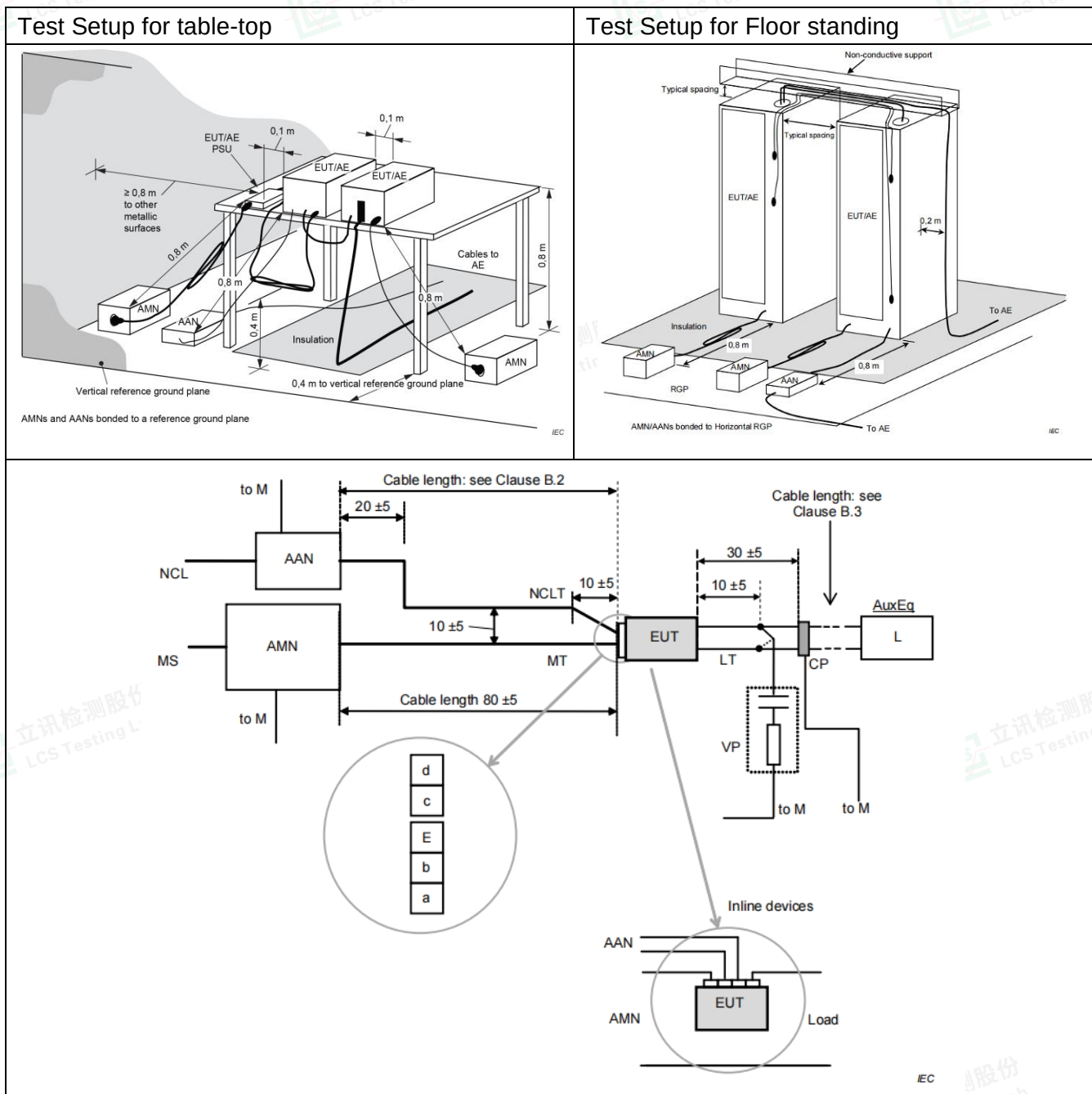
Disturbance voltage / Current limits at Asymmetric mode of Class A equipment

Frequency range [MHz]	Coupling device	Limit: Quasi-peak [dB(μV/A)]	Limit: Average [dB(μV/A)]	IF BW
0,15 - 0,5	ANN	97 - 87	84 - 74	9 kHz
0,5 - 30		87	74	
0,15 - 0,5	Voltage Probe	97 - 87	84 - 74	
0,5 - 30		87	74	
0,15 - 0,5	Current Probe	53 - 43	40 - 30	
0,5 - 30		43	30	
1) applicable to intended to connect to cables longer than 3 m.				





Test configuration



Test Procedure Description

For Table-top, EUT shall be placed at $(0,8 \pm 0,05)$ m above the reference plane of the test site selected for measurement. for Floor standing, EUT shall be placed at $(0,12 \pm 0,04)$ m above the reference plane of the test site selected for measurement.

and connected to the AC mains through artificial mains network (LISN). EUT is powered by V-type artificial power network, and the distance from LISN or ANN is 0,8m. the part of the EUT power cord exceeding 0,8m folds in parallel to form a 0,3-0,4 m eights harness.

Test Results refer to Annex A.1



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5.2. RADIATED DISTURBANCE

Standard	EN 55032:2015+A1:2020
Basic Standard(s)	EN 55016-2-3
Test method	Semi Anechoic Chamber (SAC)

SAC Radiated disturbance limit at frequencies up to 1 GHz for class B equipment

Frequency range [MHz]	Limit: Quasi-peak [dB(μV/m)]		IF BW
	3 m distance	10 m distance	
30 - 230	40	30	120 KHz
230 - 1000	47	37	
1) At the transition frequency, the lower limit applies.			

SAC Radiated disturbance limit at frequencies up to 1 GHz for class A equipment

Frequency range [MHz]	Limit: Quasi-peak [dB(μV/m)]		IF BW
	3 m distance	10 m distance	
30 - 230	50	40	120 KHz
230 - 1000	57	47	
1) At the transition frequency, the lower limit applies.			

Radiated disturbance limit at frequencies above 1 GHz for class B equipment

Frequency range [MHz]	Limit (3 m distance)		IF BW
	Peak [dB(μV/m)]	Average [dB(μV/m)]	
1000 - 6000	74	54	1MHz

Radiated disturbance limit at frequencies above 1 GHz for class A equipment

Frequency range [MHz]	Limit (3 m distance)		IF BW
	Peak [dB(μV/m)]	Average [dB(μV/m)]	
1000 - 6000	80	60	1MHz

Required highest frequency for radiated measurement

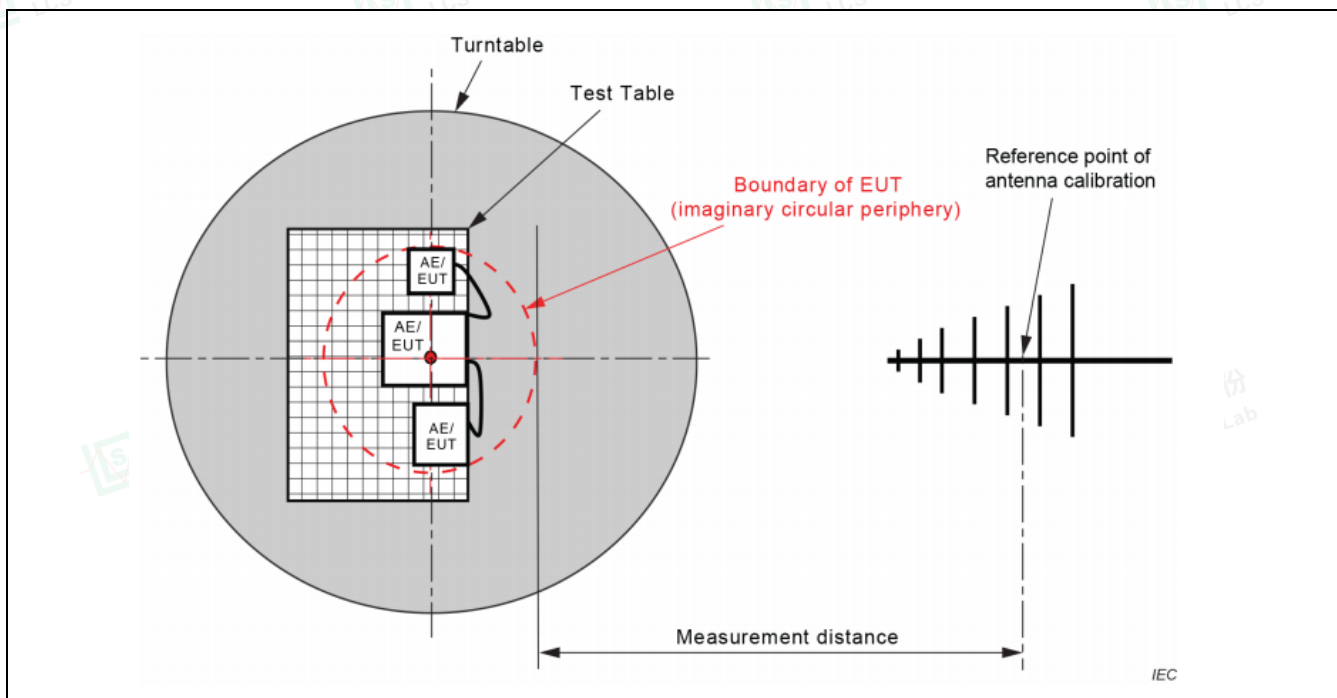
Highest internal frequency (Fx)	Highest measured frequency
$F_x \leq 108 \text{ MHz}$	1 GHz
$108 \text{ MHz} < F_x \leq 500 \text{ MHz}$	2 GHz
$500 \text{ MHz} < F_x \leq 1 \text{ GHz}$	5 GHz
$F_x > 1 \text{ GHz}$	$5 \times F_x$ up to a maximum of 6 GHz

1) Fx is highest fundamental frequency generated or used within the EUT or highest frequency at which it operates.





Test configuration



Test Procedure Description

The radiated disturbance test was conducted in a 3m Semi Anechoic Chamber and conforming to CISPR 16-2-3. the EUT is placed on a turntable, which is 0.8 meter high above the ground. the turntable can rotate 360 degrees to determine the position of the maximum emission level. the EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. the antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Log-periodic antenna or horn antenna is used as a receiving antenna. both horizontal and vertical polarization of the antenna is set on test.

Test Results refer to Annex A.2



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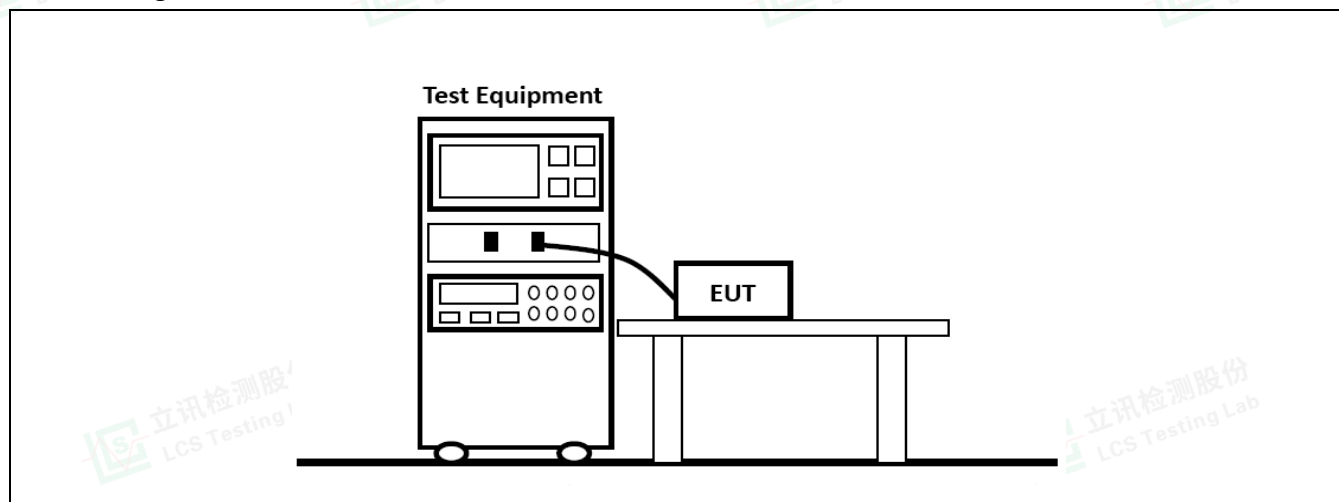


5.3. HARMONIC CURRENT

Standard	EN IEC 61000-3-2:2019+A1:2021	
Exclusions (For these categories of equipment, limits are not specified in the EN IEC 61000-3-2)	☐	Systems with nominal voltages less than 220V _{AC} (line-to-neutral)
	☐	Lighting equipment with rated power < 5 W
	☒	Equipment with rated power of ≤ 75 W (other than lighting equipment)
	☐	Professional equipment with a total rated power >1kW
	☐	Symmetrically controlled heating elements with rated power ≤ 200 W
	☐	Independent dimmers for incandescent lamps with rated power ≤ 1kW

Classification		
☐	Class A	All equipment not specified as belonging to Class B, C or D
☐	Class B	Portable tools
☐	Class C	☐ Lighting equipment with active input power > 25W
		☐ Lighting equipment with active input power ≥ 5W and ≤ 25W
		☐ Table 3, column 2 (Power-related limits)
		☐ 3rd harmonic ≤ 86%, 5th harmonic ≤ 61% and waveform conditions
		☐ THD ≤ 70%, Harmonic:3rd ≤ 35%, 5th ≤ 25%, 7th ≤ 30%, 9th and 11th ≤ 20%, 2nd ≤ 5%
☐	Class D	Personal computers, television receivers, refrigerators and freezers having one or more variable-speed drives to control compressor

Test configuration





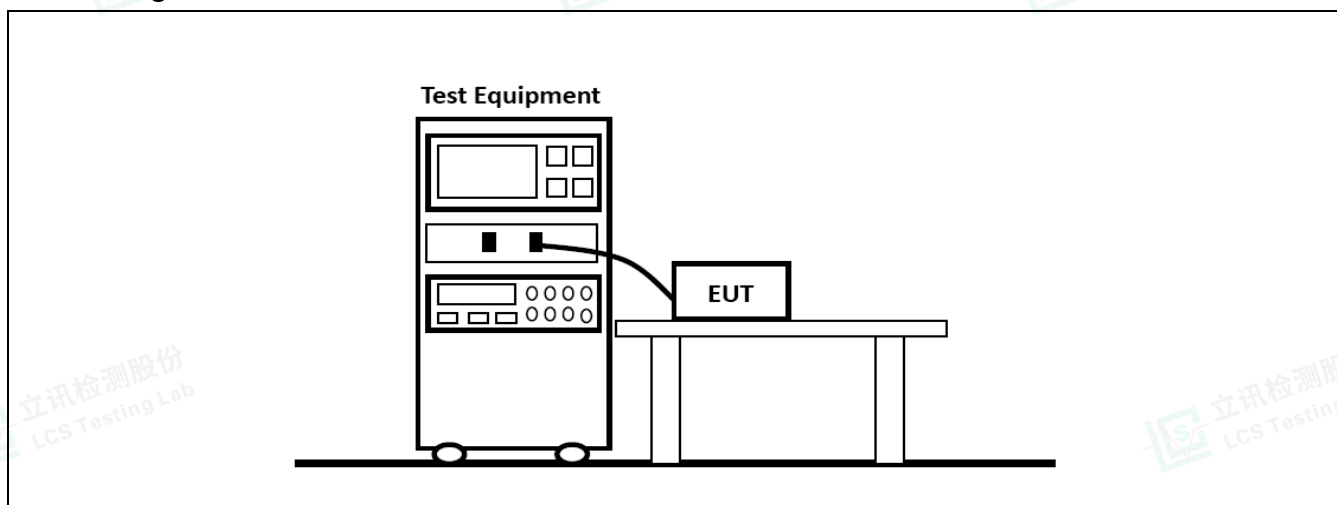
5.4. VOLTAGE FLUCTUATIONS & FLICKER

Standard	EN 61000-3-3:2013+A1:2019+A2:2021
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Limit

P _{st} (Short term flicker)	☒	≤ 1	☐	Not applicable
P _{lt} (Long-term flicker)	☒	≤ 0,65	☐	Not applicable
T _{max} (Accumulated time)	☒	≤ 500 ms	☐	Not applicable
d _c (Relative voltage change)	☒	≤ 3.3%	☐	Not applicable
d _{max} (Max.voltage change)	☒	≤ 4%	☐	≤ 6%
	☐	≤ 7%	☐	Not applicable

Test configuration



Test Results refer to Annex A.3



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6. IMMUNITY TESTS

6.1. PERFORMANCE CRITERIA

Standard	EN 55035:2017+A11:2020
----------	------------------------

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.

Examples of ports		Tests and performance criteria							
		ESD	RS	PFMF	EFT	CS	Surge	Dips	Interruption
☒	Enclosure port	B	A	A	---	---	---	---	---
☐	Analogue/digital data ports ¹	---	---	---	B	A	B	---	---
☐	DC network power ports ¹	---	---	---	B	A	B	---	---
☒	AC mains power ports	---	---	---	B	A	B	B&C	C
<u>Supplementary information:</u> 1) Applicable only to ports which, according to the manufacturer's specification, support cable lengths greater than 3 m.									





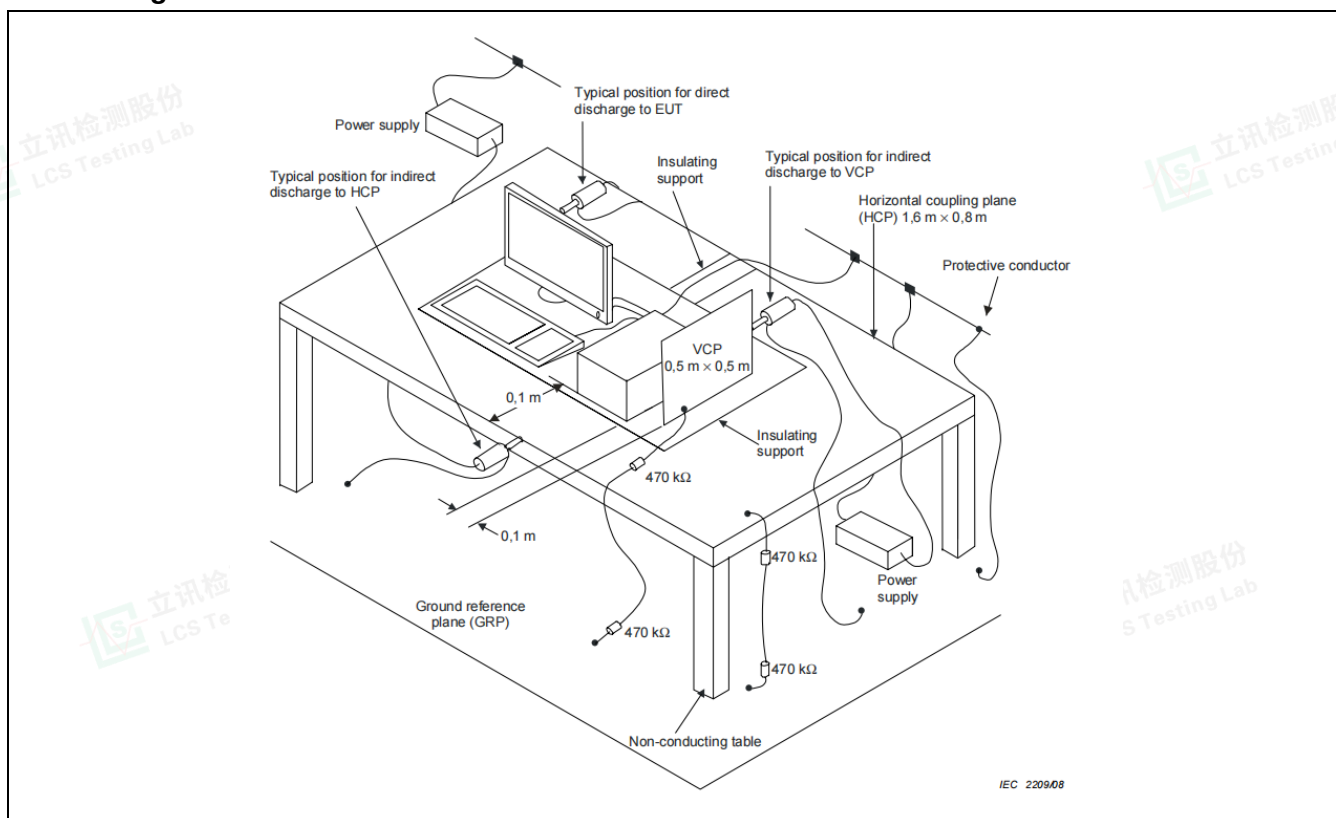
6.2. ELECTROSTATIC DISCHARGE

Electrostatic discharge (ESD) is the result of accumulated static electricity from a person or object, for example, walking on a synthetic carpet. ESD can indirectly affect the operation of equipment or damage its electronic components through direct discharge or coupling. both effects were simulated during the test. contact discharge is the preferred test method. twenty discharges (10 with positive and 10 with negative polarity) shall be applied on each accessible metallic part of the enclosure (terminals are excluded). air discharges shall be used where contact discharges cannot be applied. discharges shall be applied on the horizontal or vertical coupling planes. taken into consideration when selecting test points, paying particular attention to keyboards, dialling pads, power switches, mice, drive slots, card slots, the areas around communication ports, etc.

Requirements

Standard	EN 55035:2017+A11:2020							
Basic standard	EN 61000-4-2							
Port under test	Enclosure							
Contact discharge	☒	± 2 kV	☒	± 4 kV	☐	±8 kV	☐	kV
Air discharge	☒	± 2 kV	☒	± 4 kV	☒	±8 kV	☐	kV
Number of discharges	≥ 10 per polarity with ≥ 1 sec interval							

Test configuration



Test Results refer to Annex A.4



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6.3. RADIO-FREQUENCY ELECTROMAGNETIC FIELDS

During the test it is verified if the EUT has sufficient immunity against radiated electromagnetic fields.

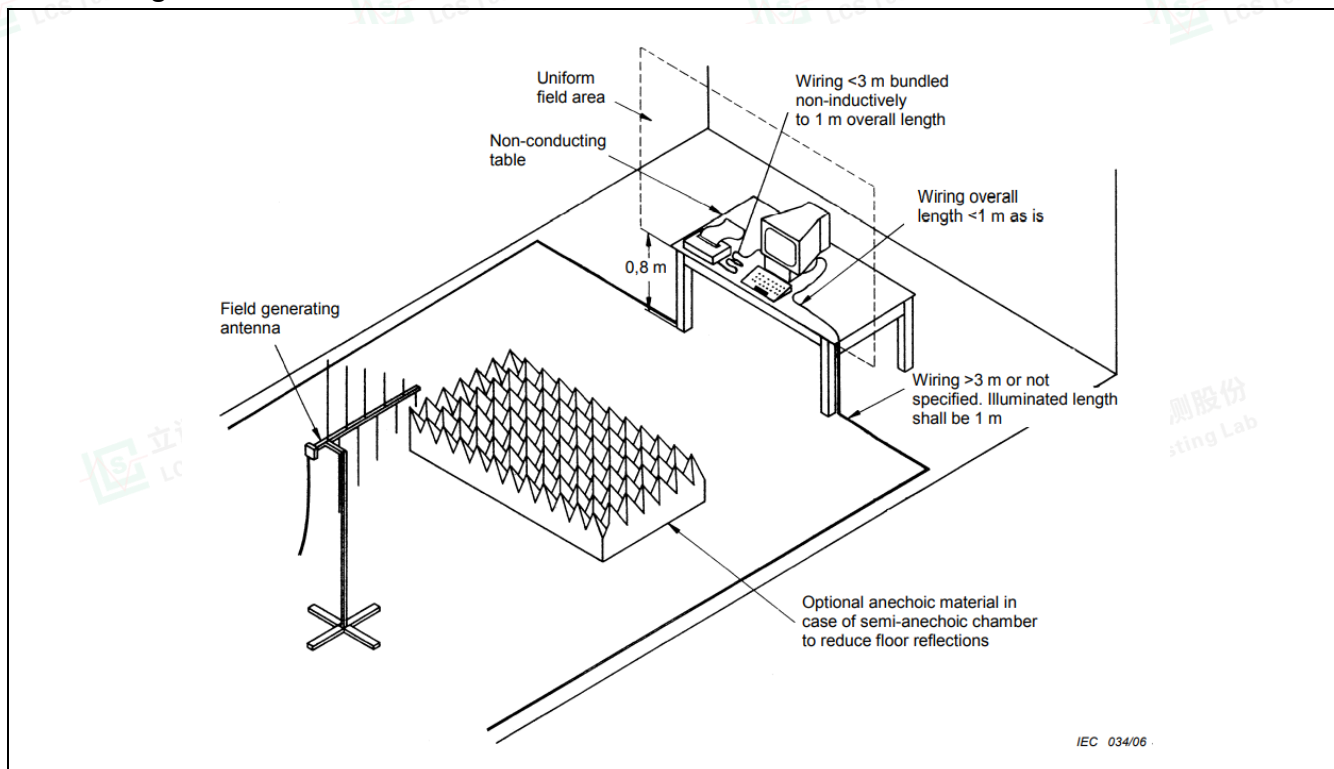
The test was carried out in a half-wave anechoic chamber with absorbent material attached to a reflective ground plate. Before the test, the test field strength needs to be calibrated. during the calibration, the corresponding relationship between the target field strength and the forward power applied to the transmitting antenna is established. during the test, except for EUT, the indoor layout is consistent with the calibration.

The EUT and its simulators are placed on a turn table which is 0,8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. both horizontal and vertical polarization of the antenna are set on test. each of the four sides of EUT must be faced this transmitting antenna and measured individually. in order to judge the EUT performance, a CCD camera is used to monitor EUT screen.

Requirements

Standard	EN 55035:2017+A11:2020			
Basic standard	EN 61000-4-3			
Port under test	Enclosure			
Frequency range	Test level	Modulation	Dwell time	Step size
80 - 1000 MHz	3 V/m	1 kHz, 80 % AM	≥ 0,5 s	≤ 1 %
1800MHz, 2600MHz, 3500MHz, 5000MHz	3 V/m	1 kHz, 80 % AM	≥ 0,5 s	≤ 1 %

Test configuration



Test Results refer to Annex A.4

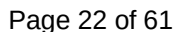


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The EUT is put on the Insulating support which is 0.1 meter high above the ground reference plane. the minimum distance between EUT and all other conductive structure, except the ground plane beneath the EUT, shall be more than 0.5 m. both polarities of the test voltage should be applied during test, fast transients are carried out with a minimum duration of 2 min with a positive polarity and a minimum of 2 min with a negative polarity.

Standard		EN 55035:2017+A11:2020		
Basic standard		EN 61000-4-4		
Pulse characteristics		5/50ns		
Port under test		Test level	Repetition frequency	Duration
☒	AC mains power	$\pm 1000 \text{ V}$	5 kHz	2 min / polarity
☐	DC network power ¹	$\pm 500 \text{ V}$	5 kHz	2 min / polarity
☐	Analogue/digital data ¹	$\pm 500 \text{ V}$	5 kHz	2 min / polarity
1) Only applicable to ports interfacing with cables whose total length may exceed 3 m.				

The diagram illustrates the test setup for the EUT (Equipment Under Test) in a laboratory environment. Key components and dimensions are labeled:

- AC mains supply:** Two AC mains supply lines are shown, one on the left and one on the right.
- EFT/B generator (A):** Located on the left, connected to the AC mains supply.
- Coupling/decoupling network (A):** Connected to the EFT/B generator (A).
- Grounding cable:** Connected to the ground reference plane.
- Ground reference plane:** A horizontal plane used for grounding.
- Insulating support:** Supports the EUT and the AE (Antenna).
- AE (Antenna):** Positioned above the EUT.
- EUT (Equipment Under Test):** The device being tested.
- Capacitive coupling clamp:** Connected to the EUT.
- Contact to the ground reference plane:** A connection point for the EUT.
- EFT/B generator (B):** Connected to the EUT.
- Insulating support:** Supports the EFT/B generator (B).
- Grounding connection according to the manufacturer's specification:** A connection point for the EUT.
- Length to be specified in the test plan:** A dimension for the grounding connection.

Dimensions are specified in meters (m):

- $>0,5\text{ m}$ (multiple locations)
- $\geq 0,5\text{ m}$
- $0,5\text{ m}$
- $0,1\text{ m}$
- $1,0\text{ m}$



6.5. CONTINUOUS INDUCED RF DISTURBANCES

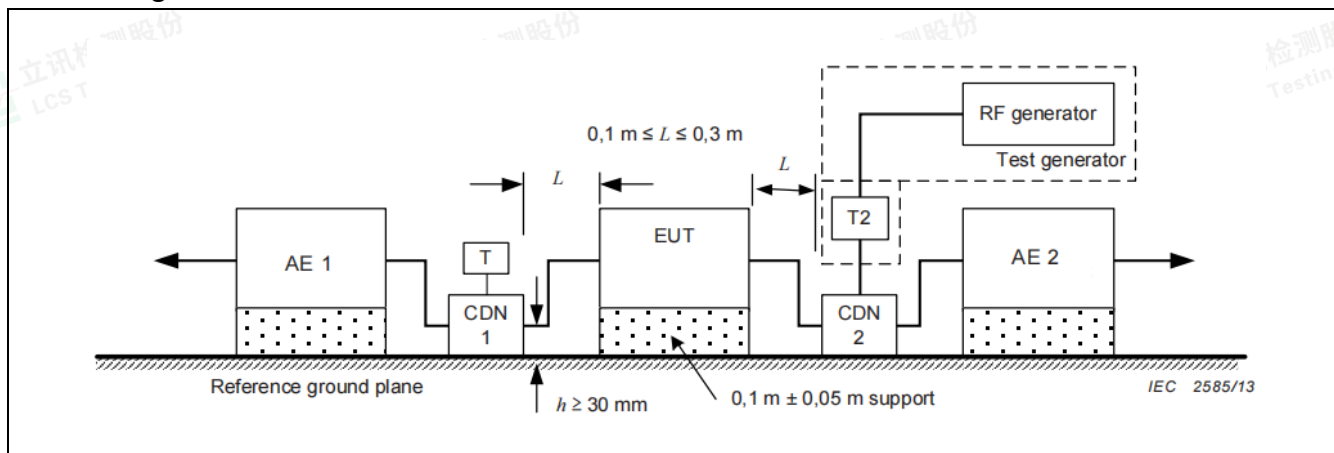
During the test the immunity of the EUT for conducted electromagnetic fields is checked .

The equipment to be tested is placed on an insulating support of $0,1\text{ m} \pm 0,05\text{ m}$ height above a reference ground plane. a non conductive roller/caster in the range of $0,1\text{ m} \pm 0,05\text{ m}$ above the reference ground plane can be used as an alternative to an insulating support. all cables exiting the EUT shall be supported at a height of at least 30 mm above the reference ground plane. The coupling and decoupling devices shall be placed on the reference ground plane, making direct contact with it at a distance of 0,1 m to 0,3 m from the EUT.

Requirements

Standard		EN 55035:2017+A11:2020			
Basic standard		EN 61000-4-6			
Frequency range		0,15 - 80MHz			
Port under test		Test level	Modulation	Dwell time	Step size
☒	AC mains power	3 - 1 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
☐	DC network power ¹	3 - 1 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
☐	Analogue/digital data ¹	3 - 1 V	1 kHz, 80 % AM	≥ 0,5 s	≤ 1%
1) Only applicable to ports interfacing with cables whose whose total length may exceed 3 m.					

Test configuration



Test Results refer to Annex A.4



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6.6. SURGE

The surge immunity test simulates unidirectional surges caused by overvoltages from switching and lightning transients.

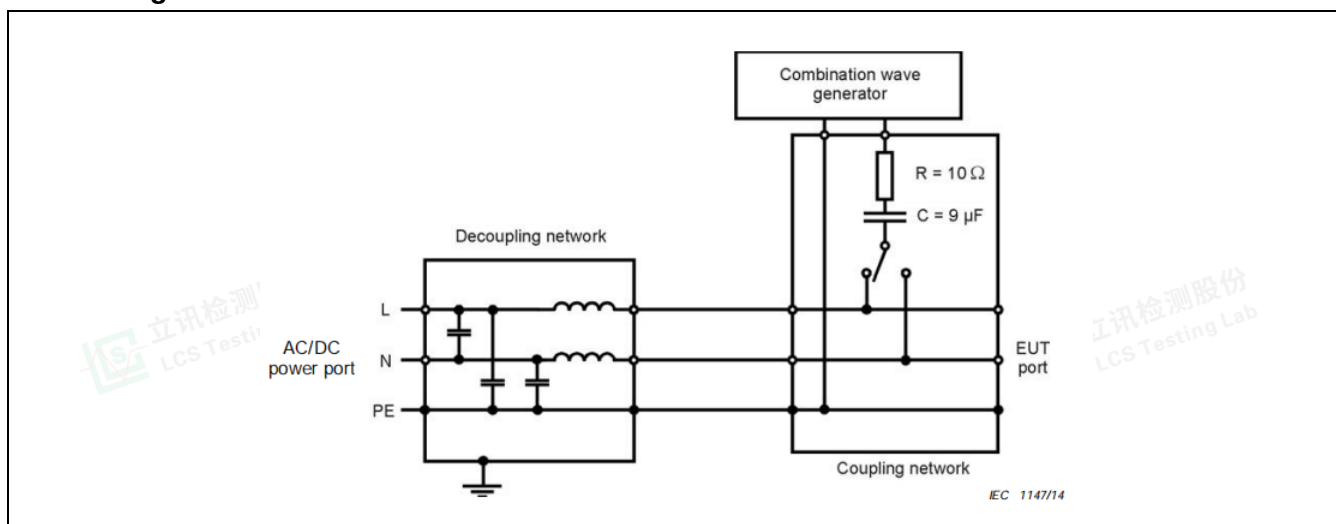
The surge is applied to the EUT power supply terminal via the capacitive coupling network, to the EUT power supply provide a 1,0 kV 1,2/50 μ s voltage surge (at open-circuit condition), at least 5 positive and 5 negative tests with 1 min or less repetition rate are conducted during test. and phase angles is 90° and 270°.

Requirements

Standard		EN 55035:2017+A11:2020		
Basic standard		EN 61000-4-5		
Pulse wave-shape		1,2/50 μ s		
Repetition rate		1 per minute or faster		
Number of pulses		5 pulses (at each polarity and phase angles)		
Port under test		Test Level	Coupling	Phase angle
☐	DC network power	+ 0.5 kV	---	90°
		- 0.5 kV	---	270°
☒	AC mains power	+ 1 kV	line - line	90°
		- 1 kV	line - line	270°
	AC mains power	+ 2 kV	line - ground	90°
		- 2 kV	line - ground	270°

1) In addition to the specified test level, all lower test levels as detailed in EN 61000-4-5 should also be satisfied.

Test configuration



Test Results refer to Annex A.4



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6.7. VOLTAGE DIPS AND SHORT INTERRUPTIONS

The surge immunity test is simulates Voltage dips and short interruptions occur due to faults in a (public or non-public) network or in installations by sudden changes of large loads.

The EUT shall be connected to the test generator for testing using the shortest power cable specified by the EUT manufacturer and, if no cable length is specified, the shortest cable suitable for the EUT, each representative mode of operation shall be tested. for short interruptions to use 0° for one of the phases.

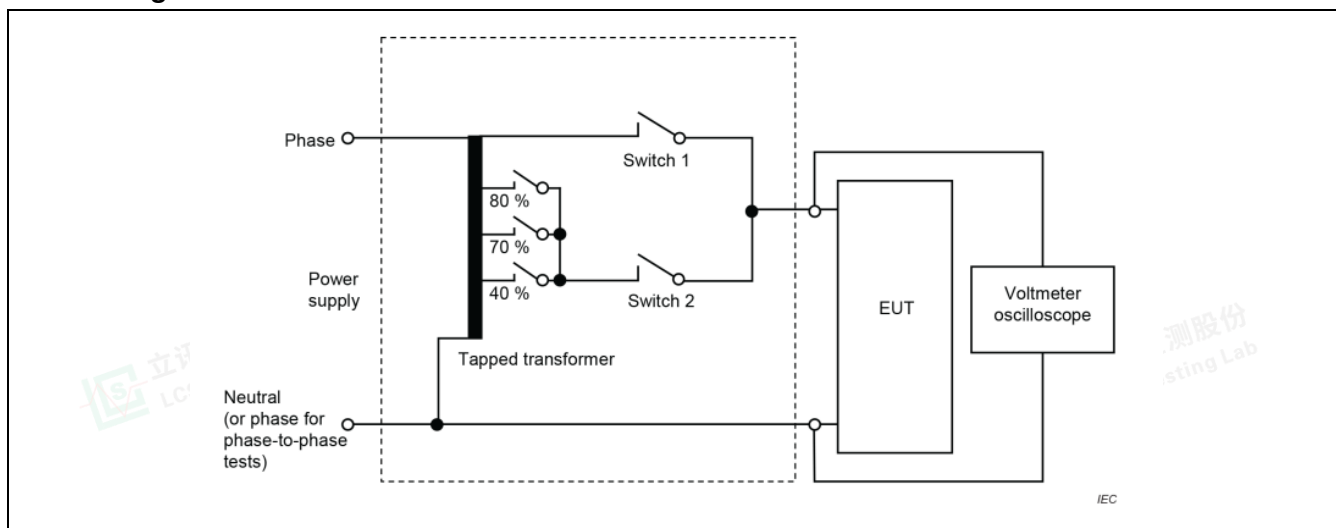
Requirements

Standard	EN 55035:2017+A11:2020		
Basic standard	EN 61000-4-11		
# of dips / interruptions	3 dips / interruptions for each test level and phase angle		
Intervals between events	≥ 10 s		
Port under test	Test level ¹	Number of periods (cycles)	
		50Hz	60Hz
AC mains power	< 5% of U_{NOM}	0,5	0,5
	70% of U_{NOM}	25	30
	< 5% of U_{NOM}	250	300

1) Where the equipment has a rated voltage range the following shall apply:

- If the voltage range does not exceed 20 % of the lower voltage specified for the rated voltage range, a single voltage within that range may be specified as a basis for the test level specification.
- in all other cases, the test procedure shall be applied for both the lowest and highest voltages declared in the voltage range.

Test configuration



Test Results refer to Annex A.4





6.8. POWER FREQUENCY MAGNETIC FIELD

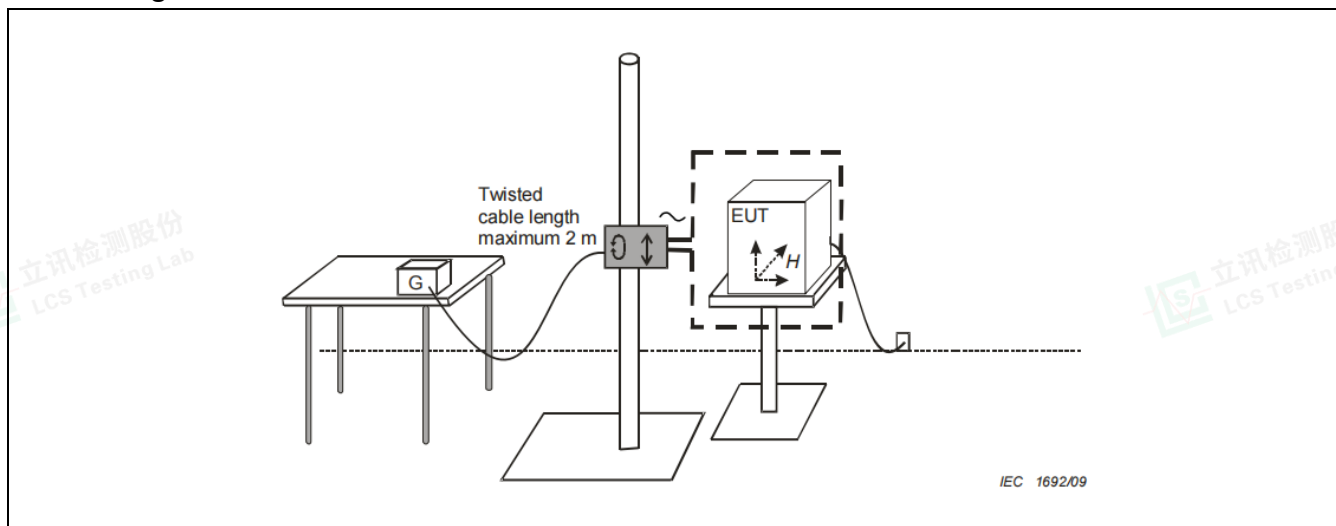
The surge immunity test is simulates Voltage dips and short interruptions occur due to faults in a (public or non-public) network or in installations by sudden changes of large loads.

The EUT shall be connected to the test generator for testing using the shortest power cable specified by the EUT manufacturer and, if no cable length is specified, the shortest cable suitable for the EUT, each representative mode of operation shall be tested. for short interruptions to use 0° for one of the phases.

Requirements

Standard	EN 55035:2017+A11:2020
Basic standard	EN 61000-4-8
Port under test	Enclosure
Field strength	1 A/m
Test frequency	50 / 60 Hz

Test configuration



Test Results refer to Annex A.4

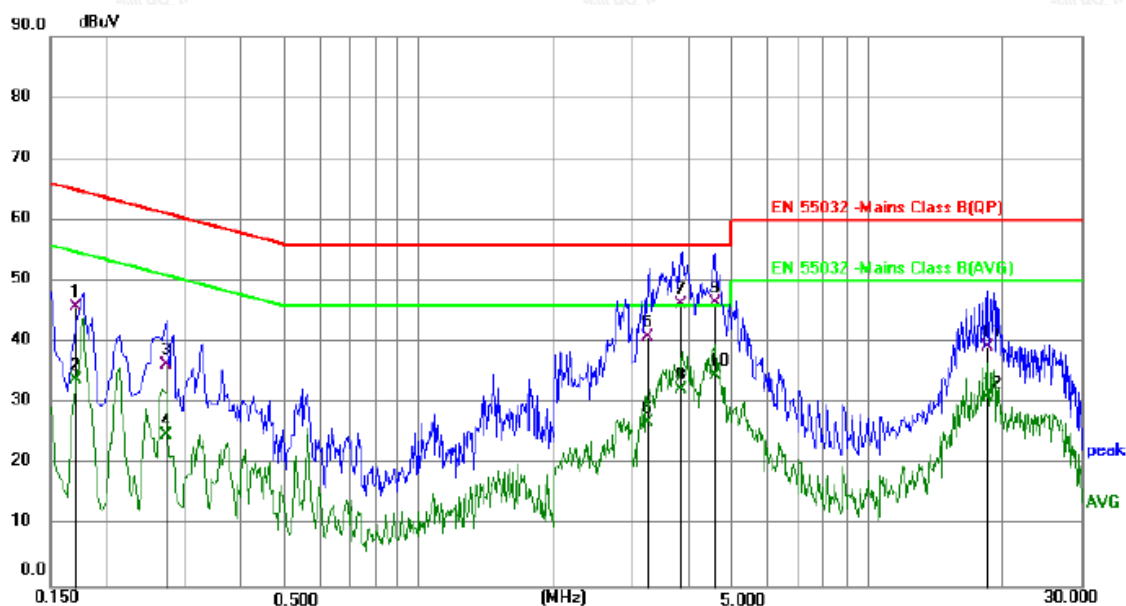




ANNEX A - TEST RESULTS

A.1. CONDUCTED DISTURBANCE TEST RESULTS

Environmental Conditions	24.0°C, 54% RH
Model	DF-XEMA-L-1803
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V,50Hz
Test engineer	Peng Dong
Pol	Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1703	34.87	10.88	45.75	64.95	-19.20	QP
2		0.1703	22.96	10.88	33.84	54.95	-21.11	AVG
3		0.2730	25.37	10.90	36.27	61.03	-24.76	QP
4		0.2730	13.92	10.90	24.82	51.03	-26.21	AVG
5		3.2424	29.83	11.03	40.86	56.00	-15.14	QP
6		3.2424	15.91	11.03	26.94	46.00	-19.06	AVG
7		3.8435	35.20	11.07	46.27	56.00	-9.73	QP
8		3.8435	21.15	11.07	32.22	46.00	-13.78	AVG
9	*	4.5906	35.33	11.08	46.41	56.00	-9.59	QP
10		4.5906	23.35	11.08	34.43	46.00	-11.57	AVG
11		18.4801	28.08	11.12	39.20	60.00	-20.80	QP
12		18.4801	19.88	11.12	31.00	50.00	-19.00	AVG



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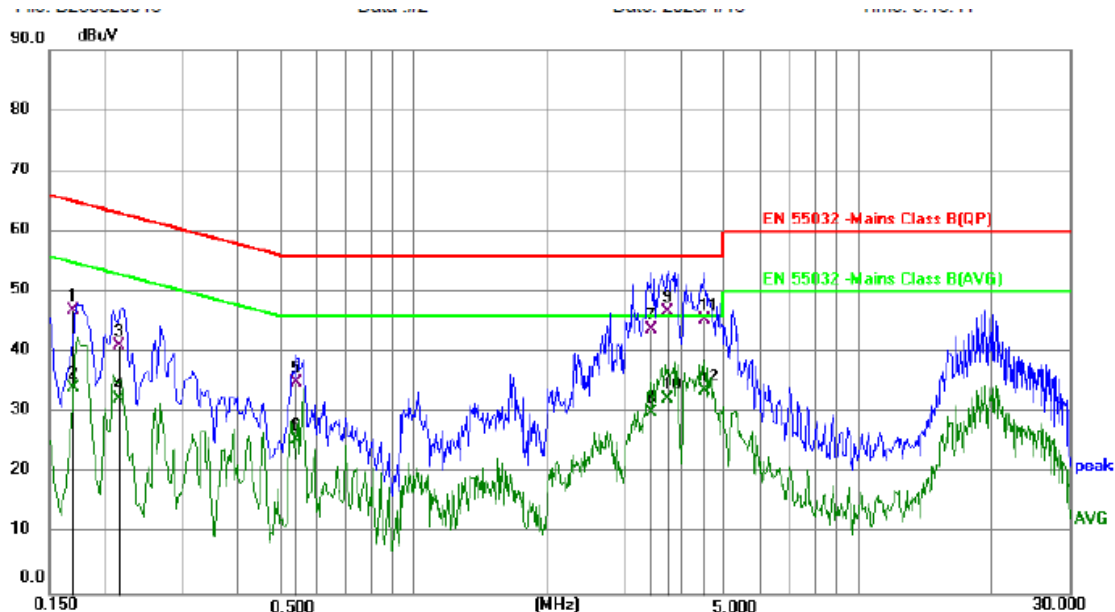
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Environmental Conditions	24.0°C, 54% RH
Model	DF-XEMA-L-1803
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V,50Hz
Test engineer	Peng Dong
Pol	Neutral



No.	Mk.	Freq. MHz	Reading Level dB	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1694	35.94	10.88	46.82	64.99	-18.17	QP	
2		0.1694	23.16	10.88	34.04	54.99	-20.95	AVG	
3		0.2170	30.26	10.89	41.15	62.93	-21.78	QP	
4		0.2170	21.50	10.89	32.39	52.93	-20.54	AVG	
5		0.5427	24.13	10.92	35.05	56.00	-20.95	QP	
6		0.5427	14.65	10.92	25.57	46.00	-20.43	AVG	
7		3.4268	32.79	10.97	43.76	56.00	-12.24	QP	
8		3.4268	19.09	10.97	30.06	46.00	-15.94	AVG	
9	*	3.7303	35.77	10.97	46.74	56.00	-9.26	QP	
10		3.7303	21.42	10.97	32.39	46.00	-13.61	AVG	
11		4.5071	34.43	11.00	45.43	56.00	-10.57	QP	
12		4.5071	22.68	11.00	33.68	46.00	-12.32	AVG	





A.2. RADIATED DISTURBANCE TEST RESULTS

Environmental Conditions	24.3°C, 56% RH
Model	DF-XEMA-L-1803
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V,50Hz
Test engineer	Peng Dong
Pol	Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree degree	Comment
1		36.0323	18.88	11.37	30.25	40.00	-9.75	QP			
2		53.4583	21.74	12.26	34.00	40.00	-6.00	QP			
3	*	112.8207	22.92	12.08	35.00	40.00	-5.00	QP			
4		126.1073	23.36	11.14	34.50	40.00	-5.50	QP			
5		148.1809	21.40	10.77	32.17	40.00	-7.83	QP			
6		183.6830	22.90	10.90	33.80	40.00	-6.20	QP			



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Environmental Conditions	24.3°C, 56% RH
Model	DF-XEMA-L-1803
Operating mode	Mode 1 (worst case)
Test voltage	AC 230V,50Hz
Test engineer	Peng Dong
Pol	Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB/m	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Antenna Height cm	Table Degree	Comment
1		51.9112	17.45	12.65	30.10	40.00	-9.90	QP			
2		100.1847	17.95	11.35	29.30	40.00	-10.70	QP			
3		116.4380	18.12	11.65	29.77	40.00	-10.23	QP			
4		119.9607	17.27	11.19	28.46	40.00	-11.54	QP			
5	*	182.6392	21.46	10.94	32.40	40.00	-7.60	QP			
6		337.8073	13.90	15.24	29.14	47.00	-17.86	QP			





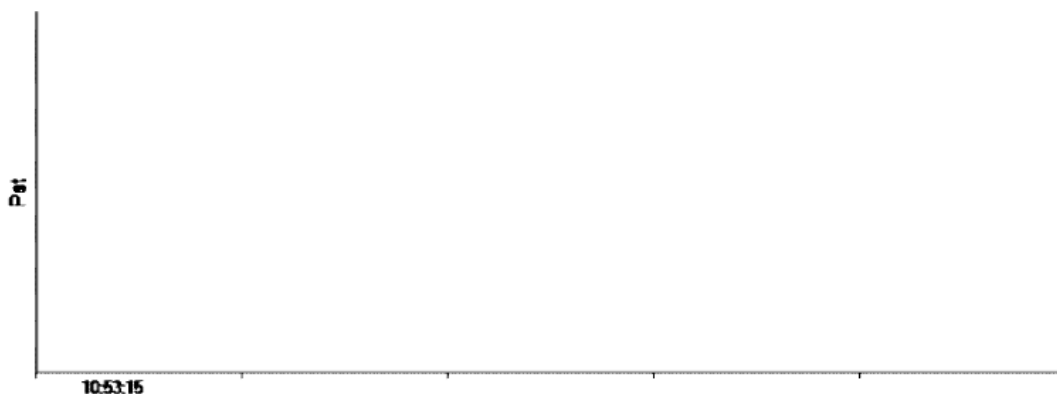
A.3. VOLTAGE FLUCTUATIONS & FLICKER TEST RESULTS

Model	DF-XEMA-L-1803
Operating mode	Mode 1
Test voltage	AC 230V,50Hz
Test engineer	Peng Dong

Load Power : 0.009 kW Power Factor:0.333
Load Current : 0.116 Arms Crest Factor:3.690
Nominal Voltage : 229.71 Vrms

Test Result: Pass Status: Test Completed

Psti and limit line European Limits



Result:

T-max (ms):	0.00	Test limit (ms):	500.00	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.00	Test limit:	1.00	Pass
Highest Plt (2 hr. period):	0.00	Test limit:	0.65	Pass



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**A.4. IMMUNITY TEST RESULTS**

ELECTROSTATIC DISCHARGE IMMUNITY TEST RESULTS					
Standard	☒ EN 55035:2017+A11:2020		☒ EN 61000-4-2		
EUT	DexSense 3D industrial camera		Temperature	24.1℃	
M/N	DF-XEMA-L-1803		Humidity	53%	
Test Mode	MODE 1		Pressure	1008mbar	
Input voltage	AC 230V,50Hz		Test Results	Pass	
Test engineer	Peng Dong				
Discharge Mode	Test Points	Test Voltage (kV) & polarity	Number of discharges/polarity	Discharge interval (s)	Performance Criteria
Contact Discharge	conductive surfaces	± 2&4	10	1	B
Air Discharge	insulating surfaces	± 2&4&8	10	1	B
VCP	-	± 4	10	1	B
HCP	-	± 4	10	1	B
Note :					



**RADIO-FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY TEST RESULTS**

Standard	☒ EN 55035:2017+A11:2020		☒ EN 61000-4-3	
EUT	DexSense 3D industrial camera		Temperature	23.7℃
M/N	DF-XEMA-L-1803		Humidity	52%
Test Mode	MODE 1		Pressure	1008mbar
Input voltage	AC 230V,50Hz		Test engineer	Baron wen
Modulation	1 kHz, 80 % AM		Test Results	Pass
Steps	1%			
Angle of EUT	Antenna polarization	Frequency Range	Test Level	Performance Criteria
0°	Vertical Horizontal	Swept Test : 80 - 1000 MHz; Spot Test : 1800MHz,2600MHz, 3500MHz, 5000MHz	3 V/m	A
90°	Vertical Horizontal		3 V/m	A
180°	Vertical Horizontal		3 V/m	A
270°	Vertical Horizontal		3 V/m	A

Note :



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**ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST RESULTS**

Standard	☒ EN 55035:2017+A11:2020		☒ EN 61000-4-4	
EUT	DexSense 3D industrial camera		Temperature	23.9℃
M/N	DF-XEMA-L-1803		Humidity	54%
Test Mode	MODE 1		Pressure	1008mbar
Input voltage	AC 230V,50Hz		Test Results	Pass
Test engineer	Peng Dong			
Port under test	Test Level & polarity	Repetition Frequency	Test duration / polarity	Performance Criteria
AC mains power	± 1 kV	5 kHz	2min	B
DC network power				
Analogue/digital data				

Note:



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**CONTINUOUS INDUCED RF DISTURBANCES TEST RESULTS**

Standard	☒ EN 55035:2017+A11:2020		☒ EN 61000-4-6	
EUT	DexSense 3D industrial camera	Temperature	23.9℃	
M/N	DF-XEMA-L-1803	Humidity	54%	
Test Mode	MODE 1	Pressure	1008mbar	
Input voltage	AC 230V,50Hz	Test Results	Pass	
Frequency range	0,15 - 80 MHz	Test engineer	Peng Dong	
Port under test	Test Level	Coupling method	Dwell time	Performance Criteria
AC mains power	3 - 1 V	CDN	3 seconds	A
DC network power				
Analogue/digital data				



**SURGE IMMUNITY TEST RESULTS**

Standard	☒ EN 55035:2017+A11:2020			☒ EN 61000-4-5		
EUT	DexSense 3D industrial camera			Temperature	23.9℃	
M/N	DF-XEMA-L-1803			Humidity	54%	
Test Mode	MODE 1			Pressure	1008mbar	
Input voltage	AC 230V,50Hz			Test Results	Pass	
Test engineer	Peng Dong					
Port under test	Coupling	Test Level & polarity(kV)	Phase angle (°)	Number of surges	Repetition rate(s)	Performance criteria
AC mains power	L - N	+ 1	90	5	60	B
		- 1	270	5	60	B
AC mains power	L - PE	+ 2	90	5	60	B
		- 2	270	5	60	B
AC mains power	N - PE	+ 2	90	5	60	B
		- 2	270	5	60	B
AC mains power	L&N - PE	+ 2	90	5	60	B
		- 2	270	5	60	B

Note:



**VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY TEST RESULTS**

Standard	☒ EN 55035:2017+A11:2020			☒ EN 61000-4-11	
EUT	DexSense 3D industrial camera			Temperature	23.9℃
M/N	DF-XEMA-L-1803			Humidity	54%
Test Mode	MODE 1			Pressure	1008mbar
Input voltage	AC 100V,60Hz / AC 240V,50Hz			Test Results	Pass
Test engineer	Peng Dong				
U _{NOM} (Vac)	Test Level (% U _{NOM})	Number of periods		Phase angle (°)	Performance criteria
		50Hz	60Hz		
100, 240	0	0,5	0,5	0	B
100, 240	70	25	30	0, 90, 180, 270	C
100, 240	0	250	300	0	C

Note:



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**POWER FREQUENCY MAGNETIC FIELD TEST RESULTS**

Standard	☒ EN 55035:2017+A11:2020		☒ EN 61000-4-8	
EUT	DexSense 3D industrial camera		Temperature	23.9℃
M/N	DF-XEMA-L-1803		Humidity	54%
Test Mode	MODE 1		Pressure	1008mbar
Input voltage	AC 230V,50Hz		Test Results	Pass
Test engineer	Peng Dong			
Axis under test	Tested Field strength	Test Frequency	Test Duration	Performance Criteria
X - axis	1 A/m	50 / 60 Hz	5 min	A
Y - axis	1 A/m	50 / 60 Hz	5 min	A
Z - axis	1 A/m	50 / 60 Hz	5 min	A



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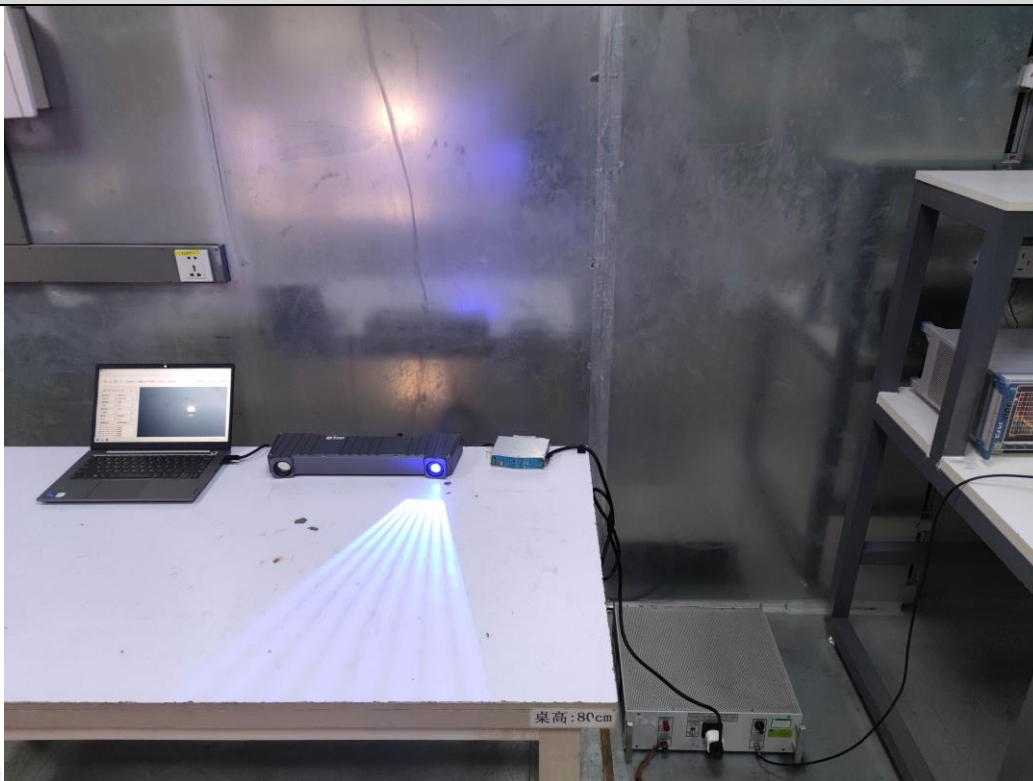
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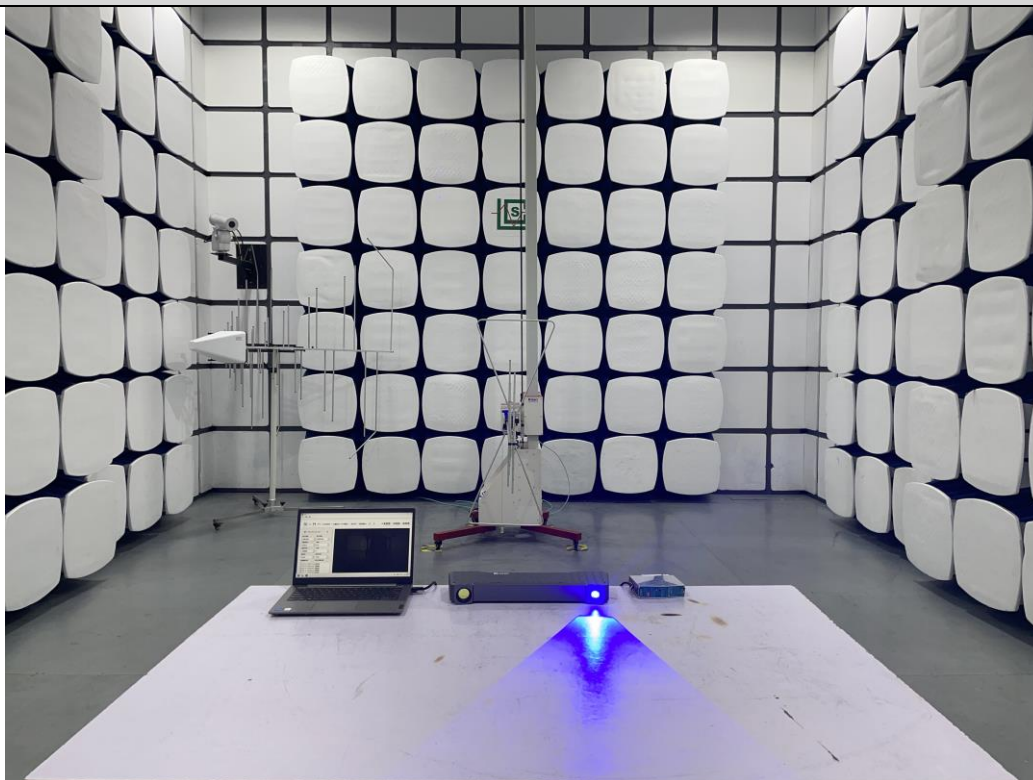


ANNEX B - TEST PHOTOS

B.1. Conducted Disturbance at AC mains power



B.2. Radiated Disturbance



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B.3. Flicker



B.4. Electrostatic Discharge



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B.5. Electrical Fast Transient / Burst



B.6. Continuous induced RF disturbances



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B.7. Surge



B.8. Voltage Dips and Short Interruptions



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B.9. Power Frequency Magnetic Field



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ANNEX C - EXTERNAL AND INTERNAL PHOTOS OF THE EUT

The photographs show the equipment under test.



Figure. 1 (DF-XEMA-L-1803)



Figure. 2



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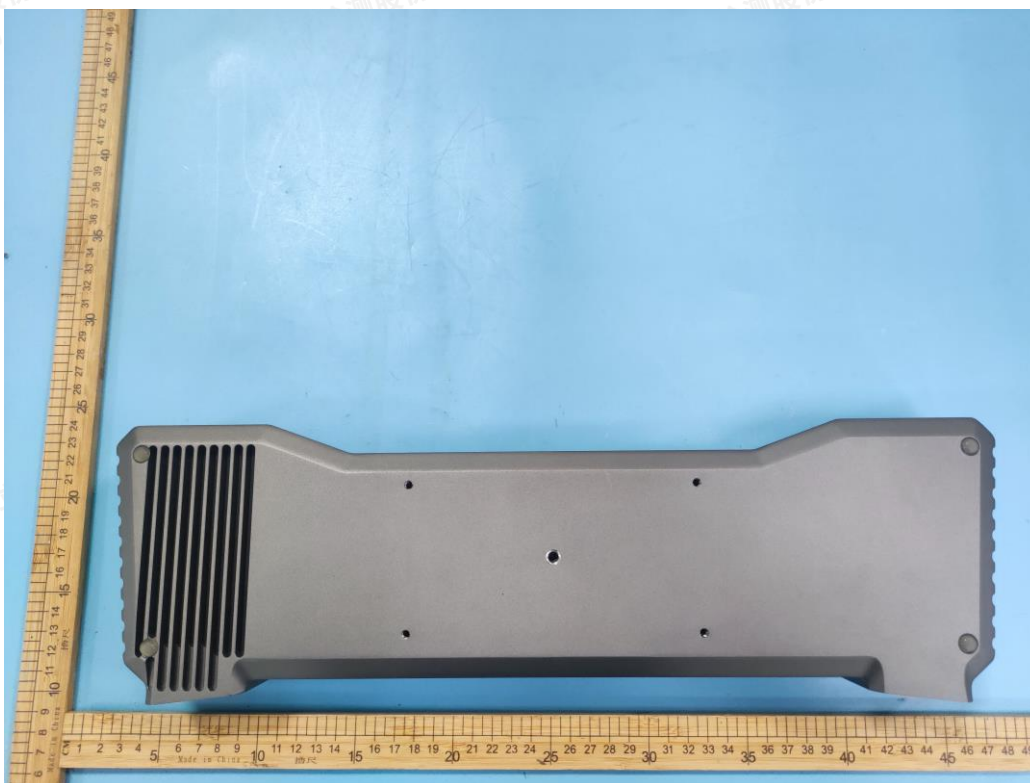


Figure. 3

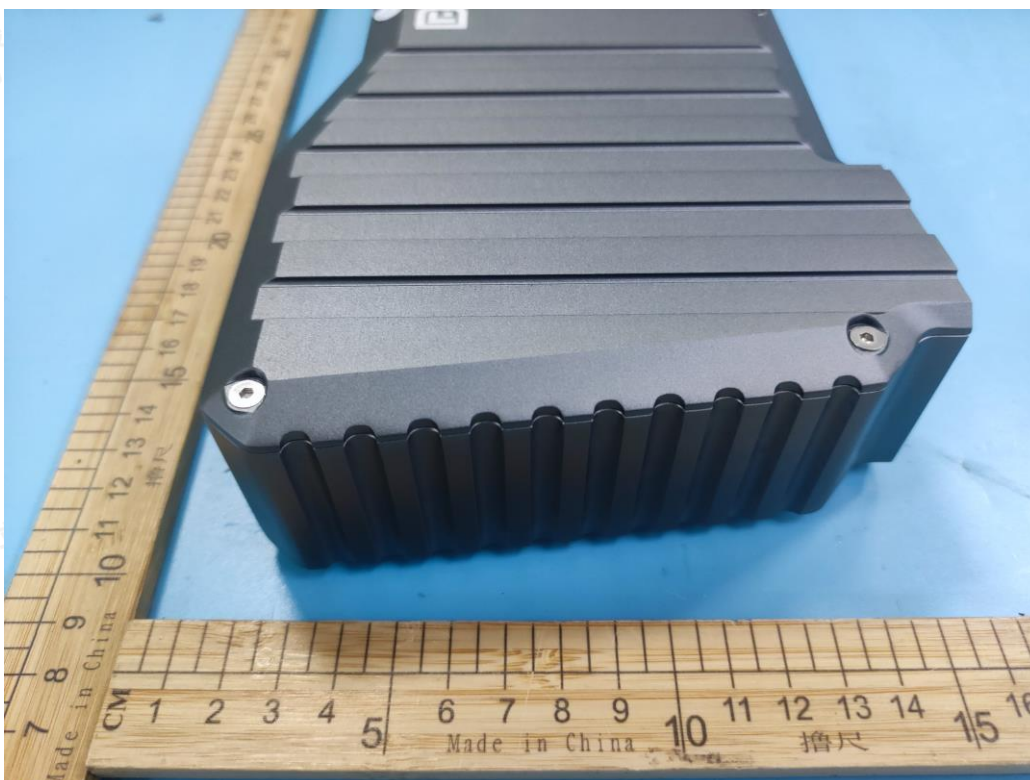


Figure. 4



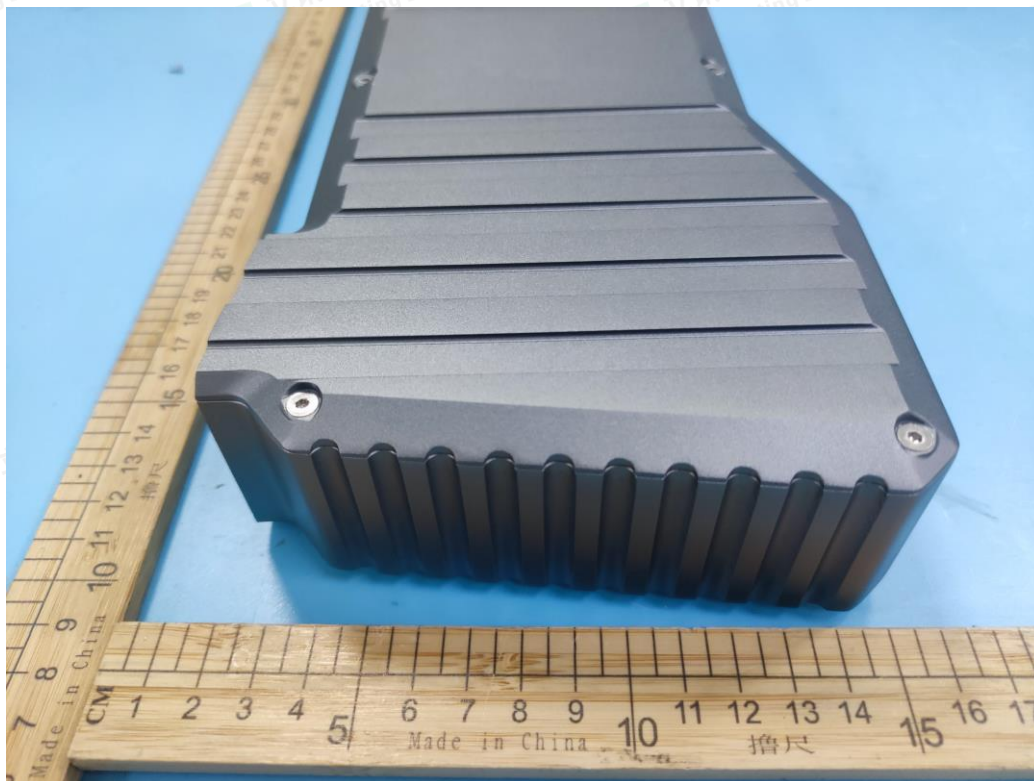


Figure. 5



Figure. 6





Figure. 7

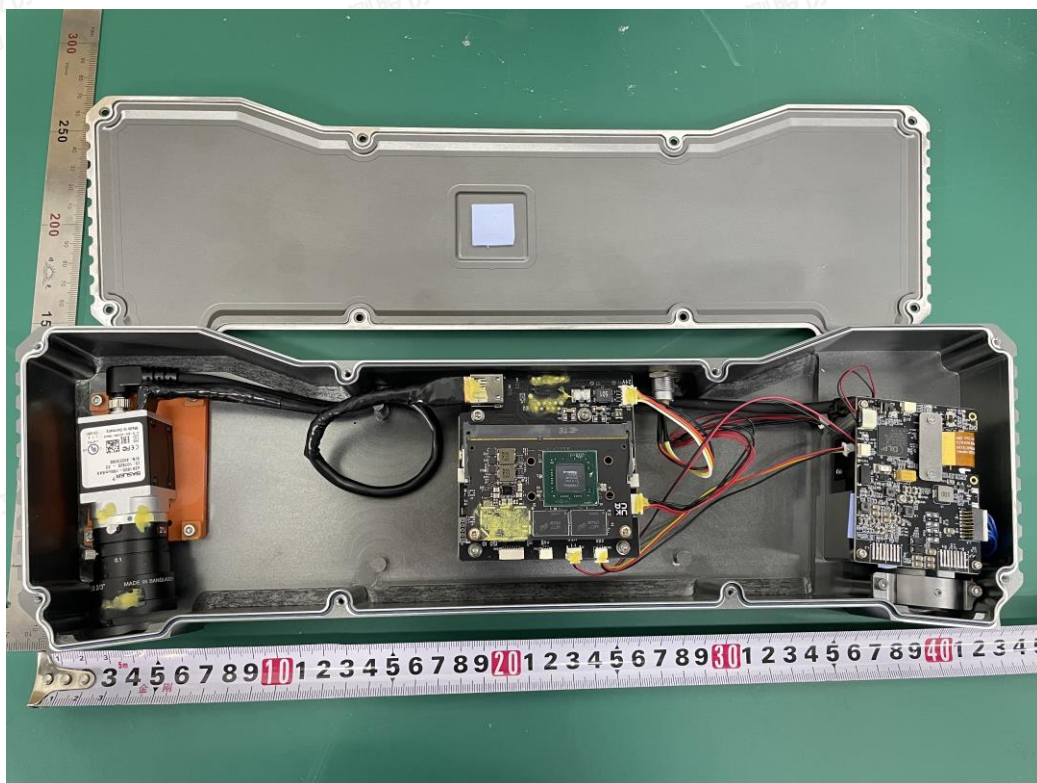


Figure. 8





Figure. 9

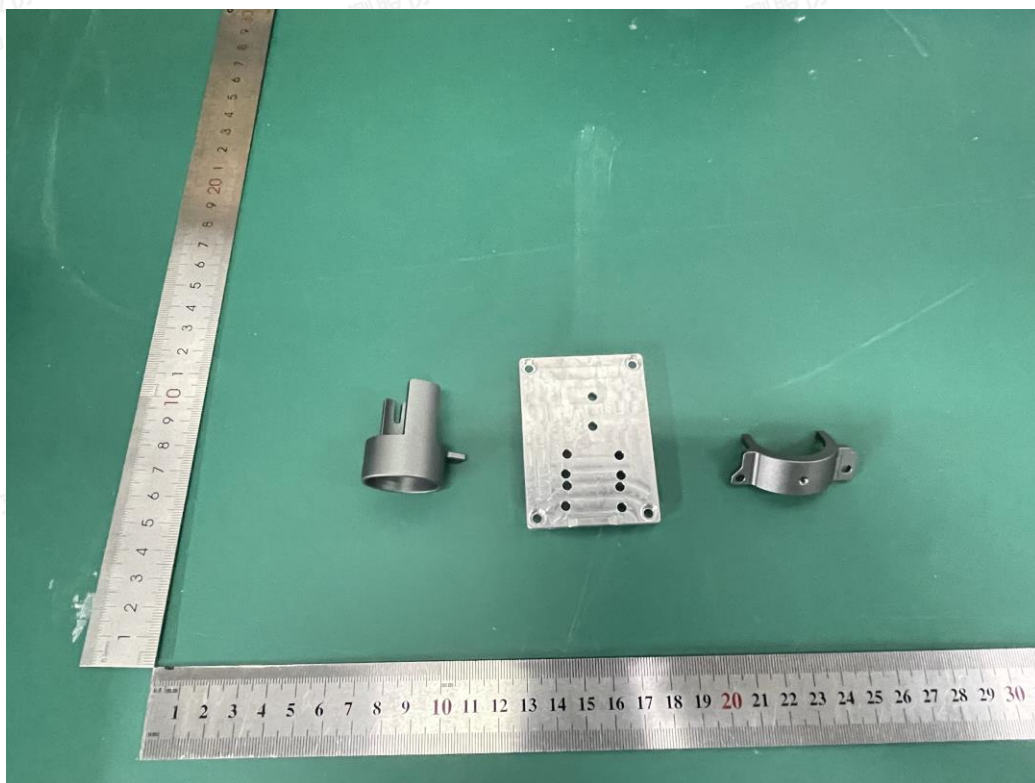


Figure. 10



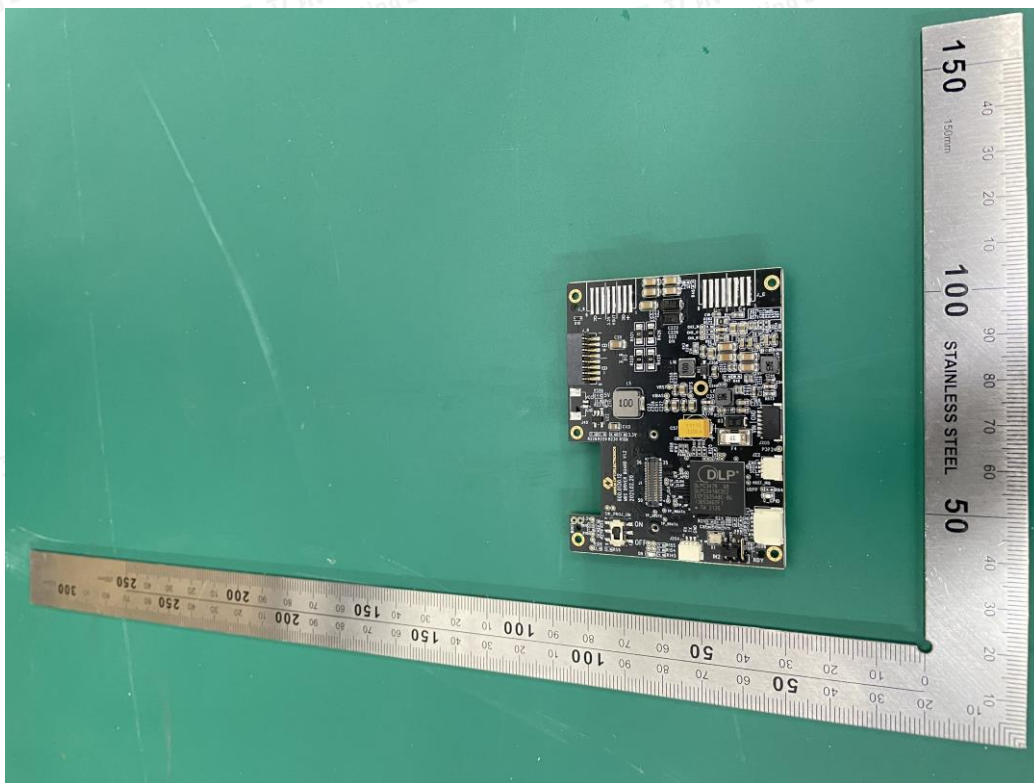


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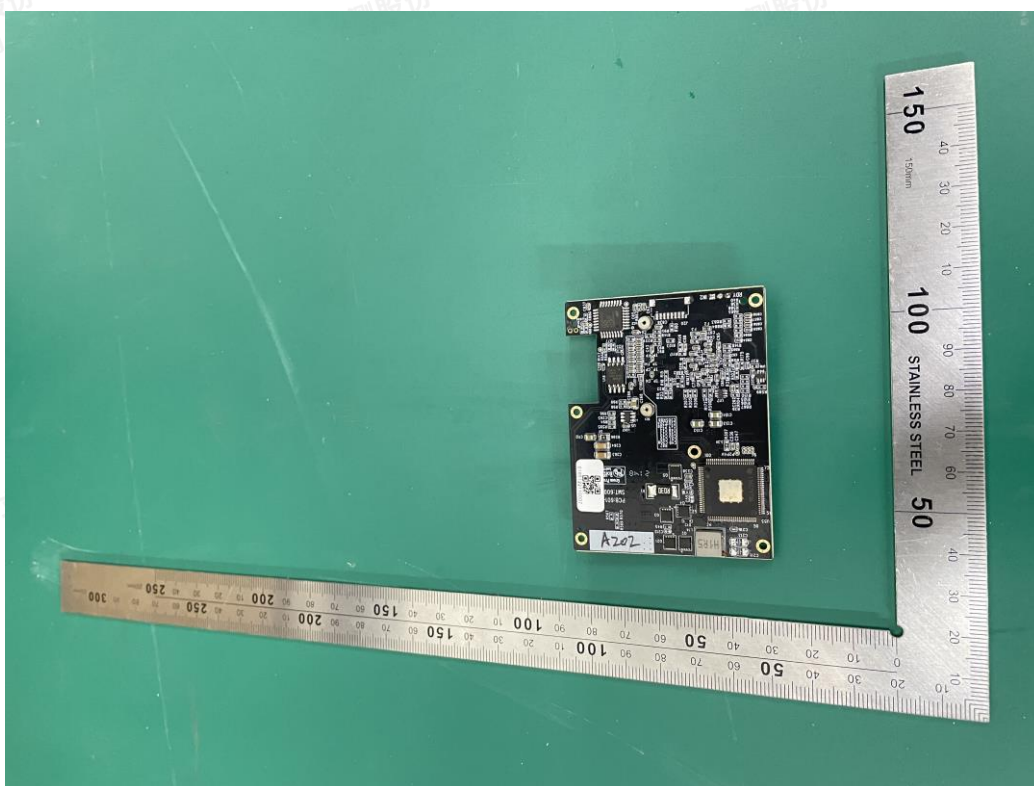


Figure. 12



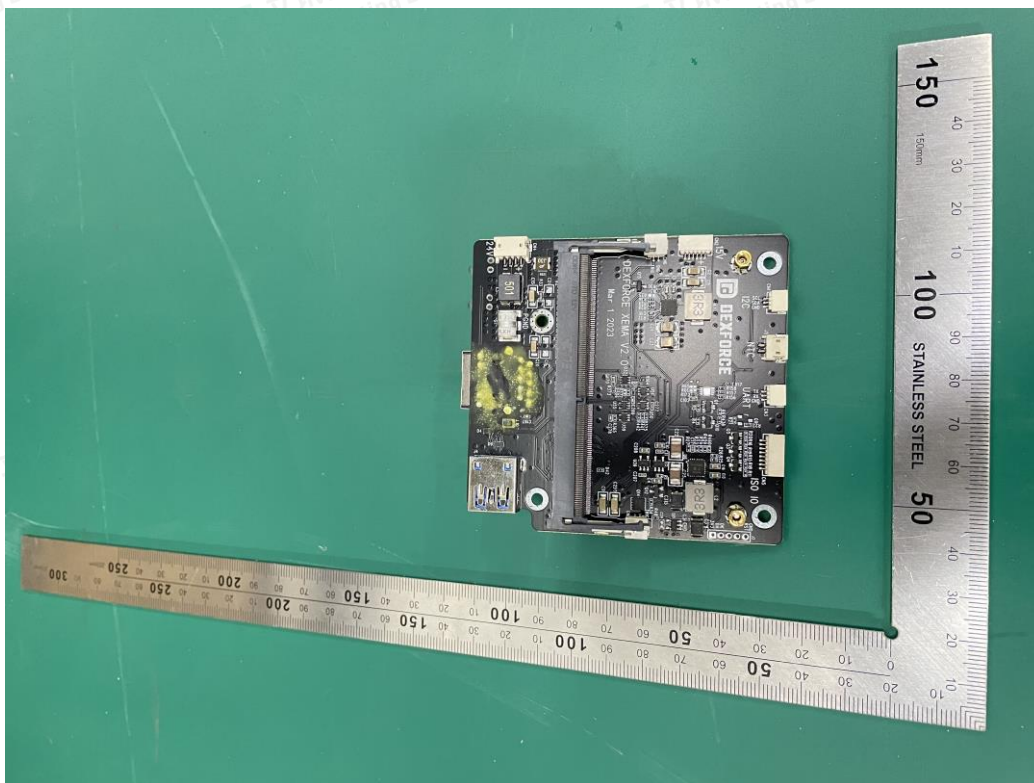


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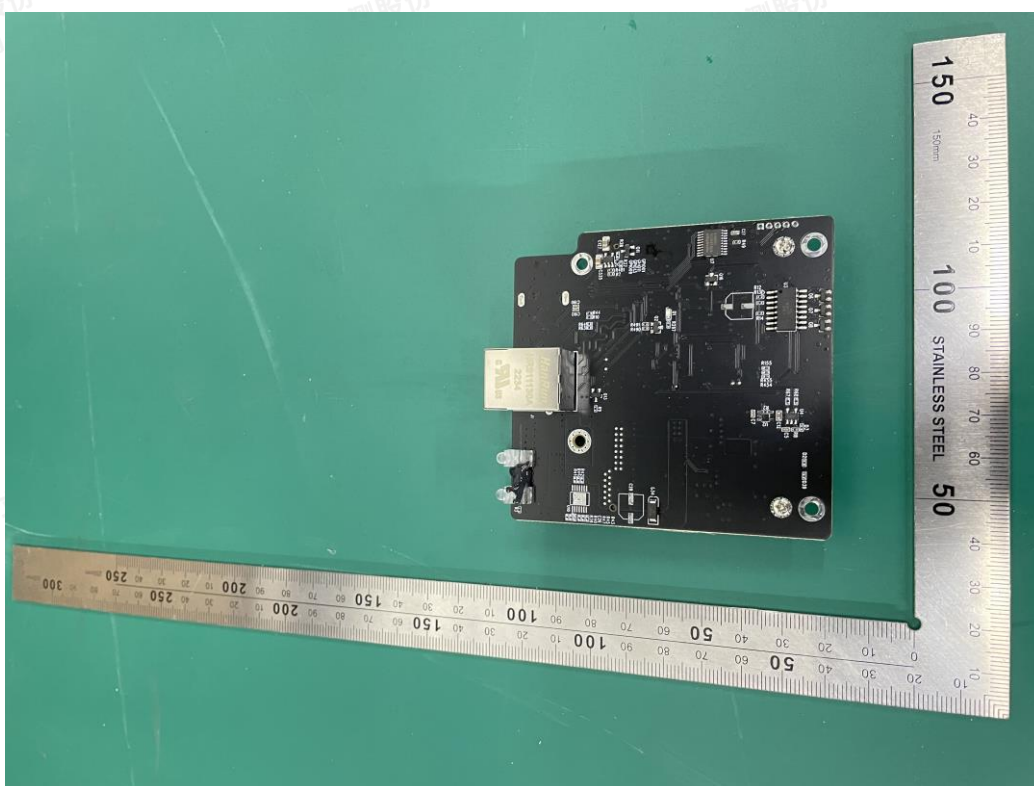


Figure. 14





Figure. 15

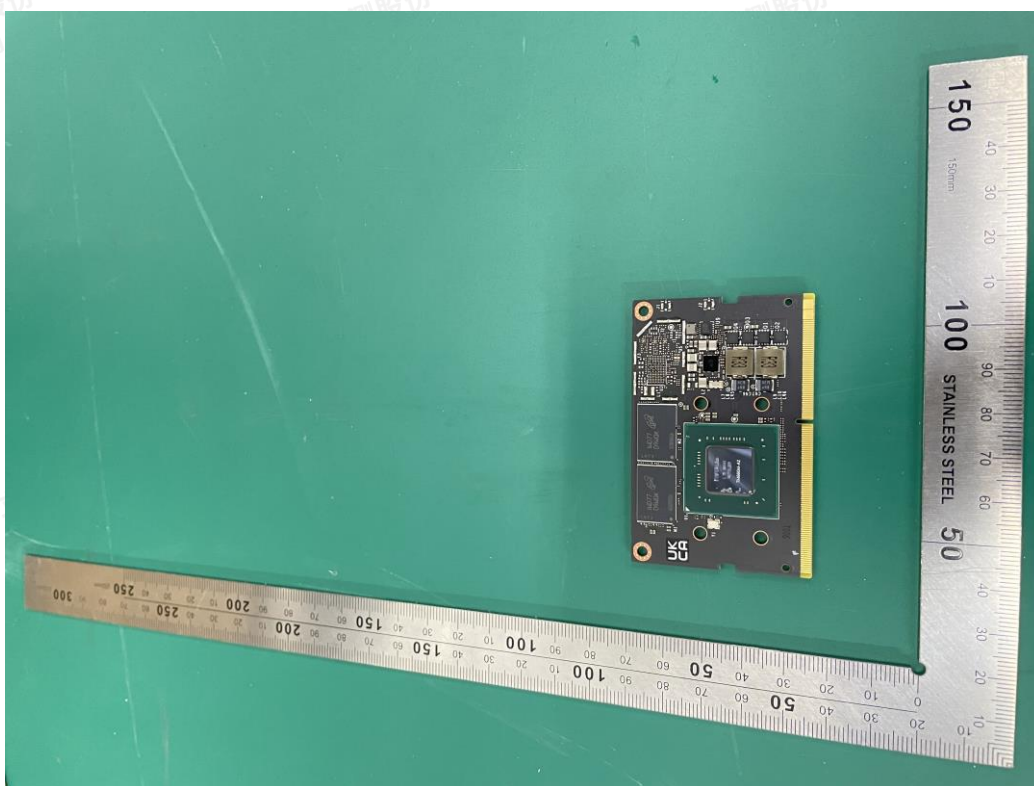


Figure. 16



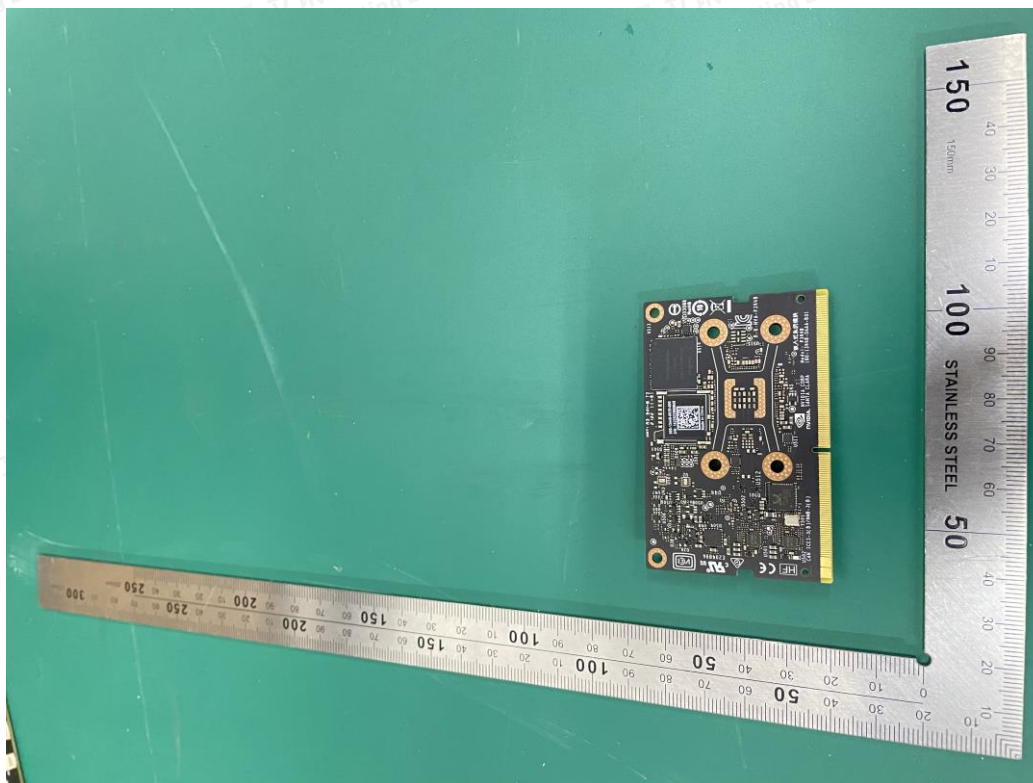


Figure. 17



Figure. 18





Figure. 19

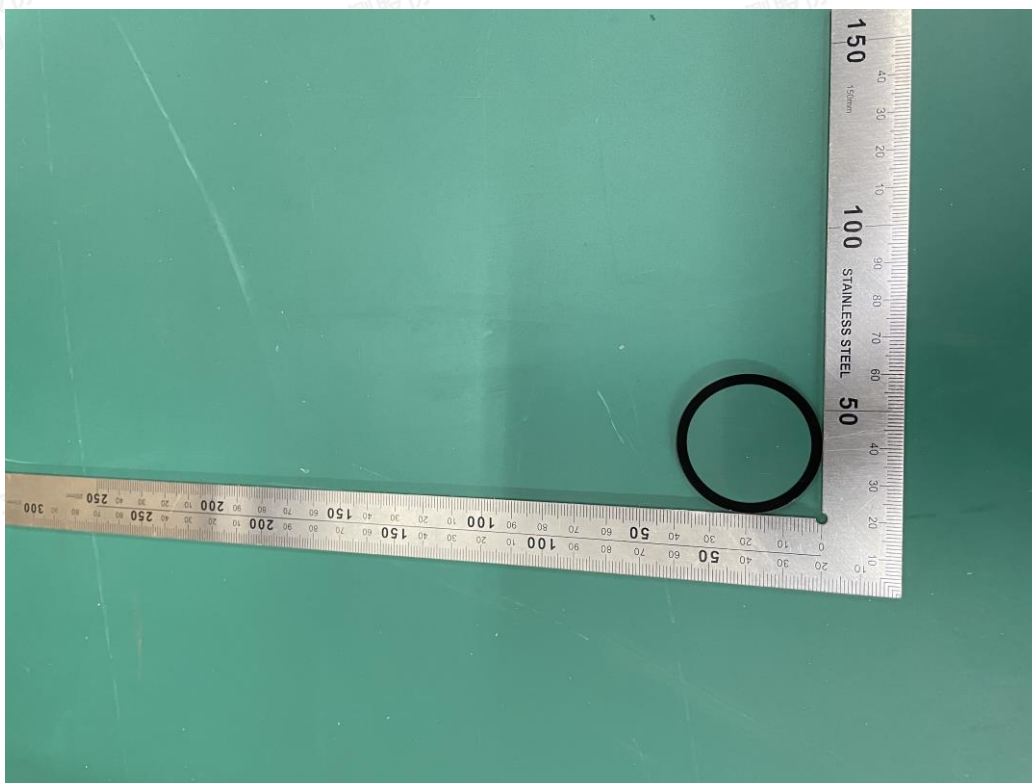


Figure. 20



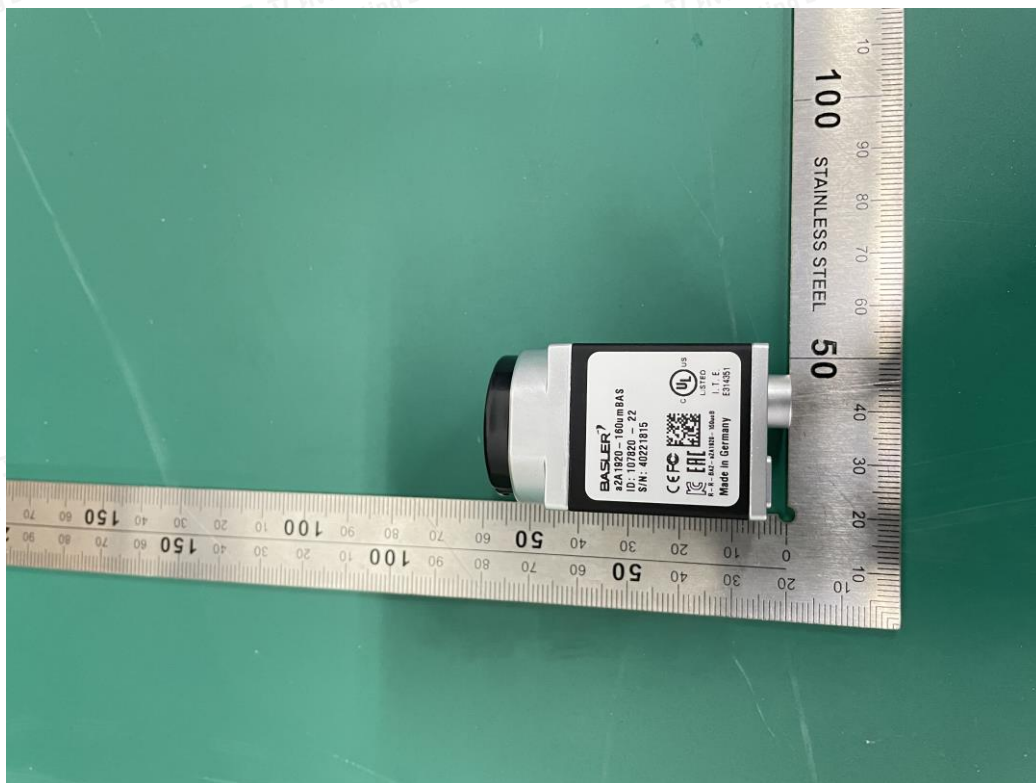


Figure. 21



Figure. 22



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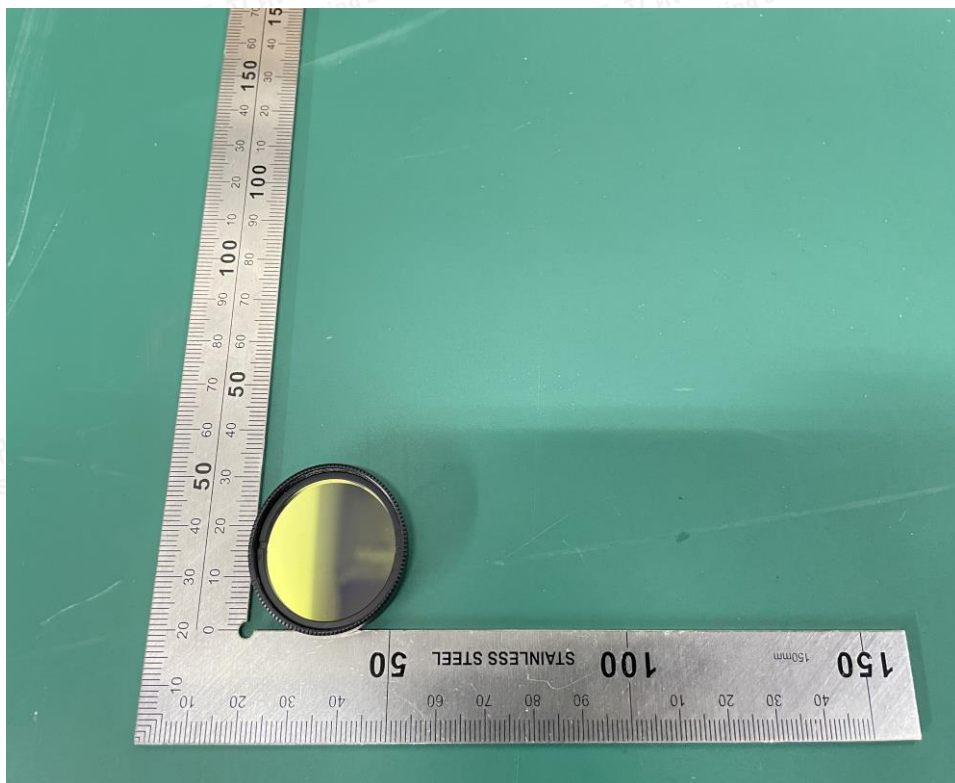


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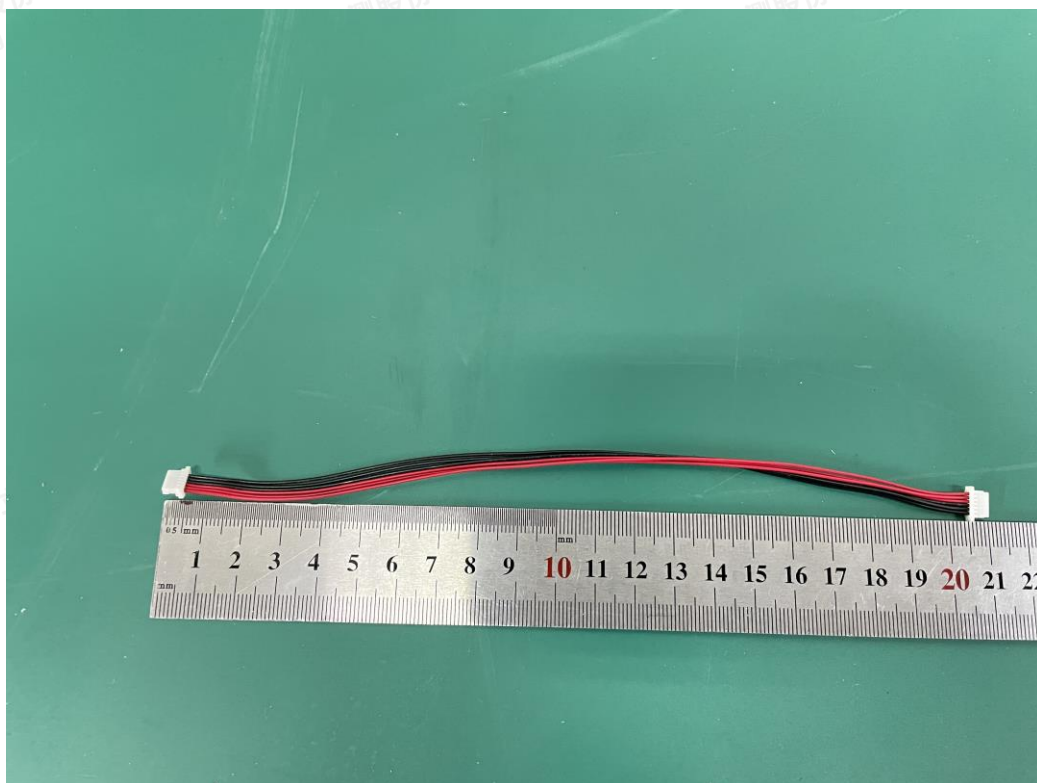


Figure. 24



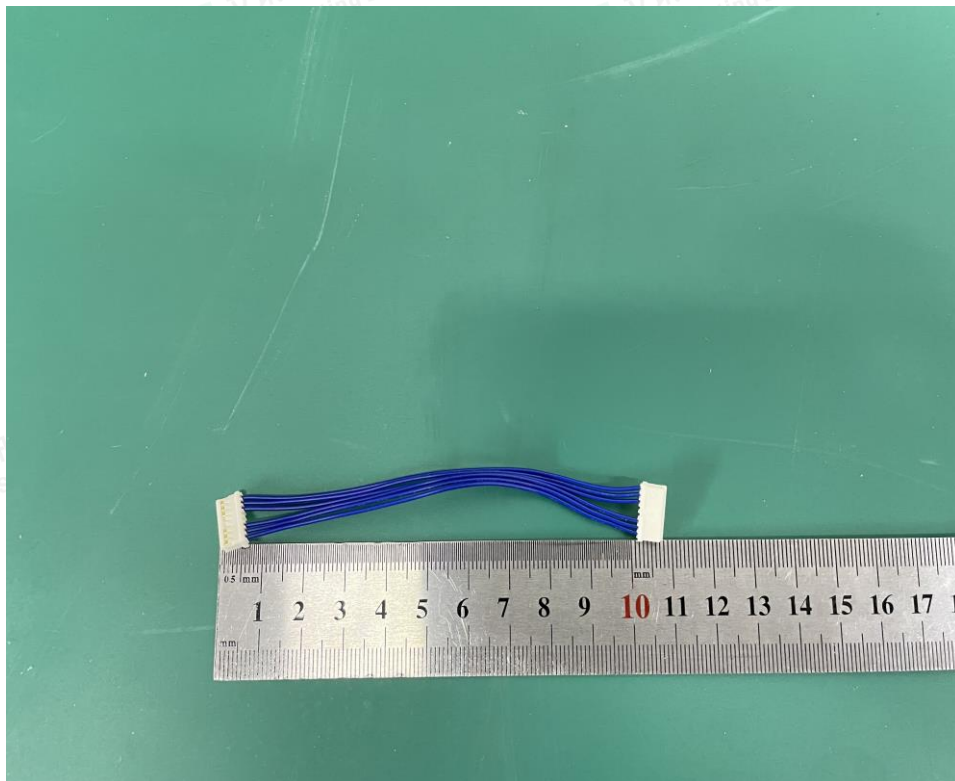


Figure. 25



Figure. 26



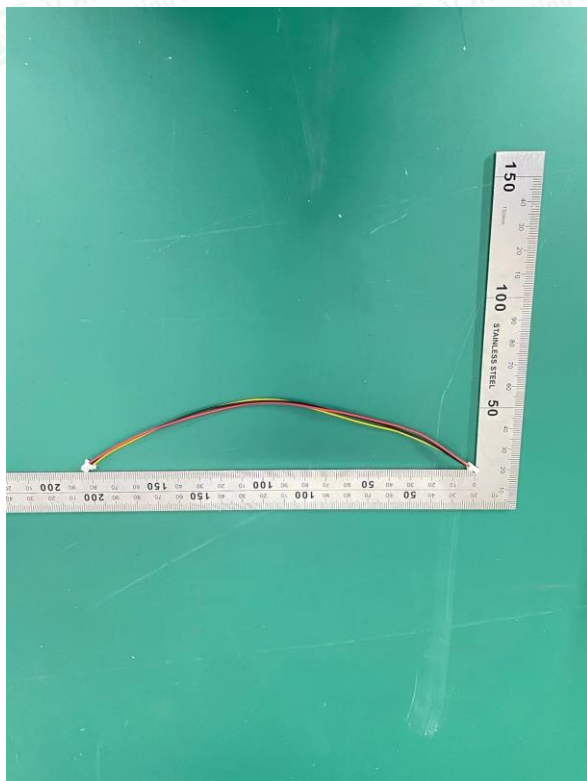


Figure. 27

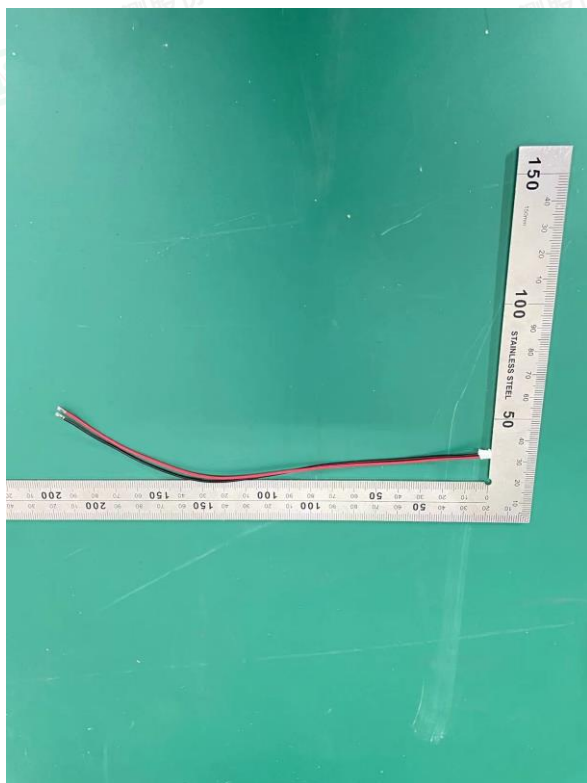


Figure. 28





Figure. 29



Figure. 30(XMEA-P)





Figure. 31



Figure. 32(XMEA-S)





Figure. 33



Figure. 34(XMEA-S)





Figure. 35



----- END -----

