





<b>Prüfbericht-Nr.:</b> Test Report No.:	<b>CN250B1F 001</b>	<b>Auftrags-Nr.:</b> Order No.:	168530402	<b>Seite 1 von 17</b> Page 1 of 17
<b>Kunden-Referenz-Nr.:</b> Client Reference No.:		<b>Auftragsdatum:</b> Order date.:	2025-01-07	
<b>Auftraggeber:</b> Client:	<b>Shenzhen Wellauto Technology Co., Ltd.</b> The Room 402, 405, BuildingC, Fenda High-tech Park, Xixiang, Hangcheng Street, Bao'an District, Shenzhencity, Guangdong, China			
<b>Prüfgegenstand:</b> Test item:	IP67 Series IO-Link slave digital module			
<b>Bezeichnung / Typ-Nr.:</b> Identification / Type No.:	AUIO 16DIOP-BUS, AUIO 16DION-BUS, AUIO 16DIOP-BUS-E, AUIO 16DION-BUS-E, AUIO 16DION-T, AUIO 16DIOP-TE, AUIO 16DION-TE, AUIO 8DIOP-E, AUIO 8DION-E, AUIO 8DOPH, AUIO 16DIOP, AUIO 16DION, AUIO 16DIOP-E, AUIO 16DION-E, AUIO 16DIOP-BUS-W, AUIO 16DION-BUS-W, AUIO 16DIOP-TW, AUIO 16DION-TW, AUIO 8DOPH-W, AUIO 16DIOP-W, AUIO 16DION-W, AUIO 16DIOP-T  (Trademark: 华茂欧特 )			
<b>Auftrags-Inhalt:</b> Order content:	TUV Rheinland - EMC service			
<b>Prüfgrundlage:</b> Test specification:	EN 55032:2015+A11+A1 EN 55035:2017+A11			
<b>Wareneingangsdatum:</b> Date of receipt:	2025-01-07			
<b>Prüfmuster-Nr.:</b> Test sample No.:	A003386883-001-002			
<b>Prüfzeitraum:</b> Testing period:	2025-01-07-2025-02-27			
<b>Ort der Prüfung:</b> Place of testing:	TÜV Rheinland (Shenzhen) Co., Ltd.			
<b>Prüflaboratorium:</b> Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
<b>Prüfergebnis*:</b> Test result*:	Pass			
<b>geprüft von:</b> tested by: Chunli Zheng		<b>genehmigt von:</b> authorized by: Ware Xin		
<b>Datum:</b> Date: 2025-02-28		<b>Ausstellungsdatum:</b> Issue date: 2025-02-28		
<b>Stellung / Position:</b>	Sachverständige(r)/Expert	<b>Stellung / Position:</b>	Sachverständige(r)/Expert	
<b>Sonstiges / Other:</b>				
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> Condition of the test item at delivery:		Prüfmuster vollständig und unbeschädigt Test item complete and undamaged		
* Legende: Legend:	P(ass) = entspricht o.g. Prüfgrundlage(n) P(ass) = passed a.m. test specifications(s)	F(ail) = entspricht nicht o.g. Prüfgrundlage(n) F(ail) = failed a.m. test specifications(s)	N/A = nicht anwendbar N/A = not applicable	N/T = nicht getestet N/T = not tested
<b>Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.</b> <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>				

### Remarks Anmerkungen

<b>1</b>	<p>The equipment used during the specified testing period was calibrated according to our test laboratory calibration program. The equipment fulfils the requirements included in the relevant standards. The traceability of the test equipment used is ensured by compliance with the regulations of our management system.</p> <p>Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</p> <p><i>Alle eingesetzten Prüfmittel waren zum angegebenen Prüfzeitraum gemäß eines festgelegten Kalibrierungsprogramms unseres Prüfhauses kalibriert. Sie entsprechen den in den Prüfprogrammen hinterlegten Anforderungen. Die Rückverfolgbarkeit der eingesetzten Prüfmittel ist durch die Einhaltung der Regelungen unseres Managementsystems gegeben. Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</i></p>
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<b>3</b>	<p>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report. Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</p> <p><i>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben. Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</i></p>
<b>4</b>	<p>The decision rule for statements of conformity, based on numerical measurement results, in this test report is based on the "Zero Guard Band Rule" and "Simple Acceptance" in accordance with ILAC G8:2019 and IEC Guide 115:2021, unless otherwise specified in the applied standard mentioned on Page 1 of this report or requested by the customer. This means that measurement uncertainty is not taken in account and hence also not declared in the test report. For additional information to the resulting risk based of this decision rule please refer to ILAC G8:2019.</p> <p><i>Die Entscheidungsregel für Konformitätserklärungen basierend auf numerischen Messergebnissen in diesem Prüfbericht basiert auf der "Null-Grenzwert-Regel" und der "Einfachen Akzeptanz" gemäß ILAC G8:2019 und IEC Guide 115:2021, es sei denn, in der auf Seite 1 dieses Berichts genannten angewandten Norm ist etwas anderes festgelegt oder vom Kunden gewünscht. Dies bedeutet, dass die Messunsicherheit nicht berücksichtigt wird und daher auch nicht im Prüfbericht angegeben wird. Zu weiteren Informationen bezüglich des Risikos durch diese Entscheidungsregel siehe ILAC G8:2019.</i></p>
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## TEST SUMMARY

**5.1.1 RADIATED EMISSIONS (BELOW 1GHz)**

*RESULT: Pass*

**5.1.2 RADIATED EMISSIONS (ABOVE 1GHz)**

*Not Applicable*

**6.2.1 CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES, SWEPT TEST**

*RESULT: Pass*

**6.2.2 CONTINUOUS RF ELECTROMAGNETIC FIELD DISTURBANCES, SPOT TEST**

*RESULT: Pass*

**6.3.1 ELECTROSTATIC DISCHARGES (ESD)**

*RESULT: Pass*

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## 1. General Remarks

### 1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test result

Appendix 2: Measurement uncertainties

## 2. Test Sites

### 2.1 Test Facilities

**TÜV Rheinland (Shenzhen) Co., Ltd.**

2-3F, 101 & 102, No.2 Nuclear Power Industrial Park Fuming Community, Fucheng Street,  
Longhua District Shenzhen, Guangdong Province P.R. China

CNAS Registration No.: L3080

## 2.2 List of Test and Measurement Instruments

**Table 1: List of Test and Measurement Equipment**

**TÜV Rheinland (Shenzhen) Co., Ltd.**

<b>Radiated Emission (3m chamber)</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Until</b>
3m SAC	ETS-Lindgren	SAC3	CT001632-Q1362	2027-09-11
EMI Test Receiver	R&S	ESR7	102111	2025-08-18
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2025-07-17
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A
<b>Radio Frequency Electromagnetic Fields (RS)</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Until</b>
3m FAC	ETS	FAC3	CT001632-Q1360	2027-09-12
Signal Generator	R&S	SMB100A	115183	2025-08-18
Power Amplifier	R&S	BBA150-BC250	103102	2025-08-18
Power Amplifier	R&S	BBA150-D110E100	103117	2025-08-18
NRP6AN Average Power Sensor	R&S	NRP6AN	101161	2025-10-11
NRP6AN Average power sensor	R&S	NRP6AN	101162	2025-10-11
Stacked double Log.-Per. Antenna1825022	SCHWARZBECK	STLP 9128E	0153	2026-01-11
Stacked Log.-Per. Antenna	SCHWARZBECK	STLP 9149	00520	2026-01-11
EMC32 Test Software	R&S	EMC32(Ver.10.30.01)	N/A	N/A
<b>Electrostatic Discharge (ESD)</b>				
<b>Equipment</b>	<b>Manufacturer</b>	<b>Model No.</b>	<b>Serial No.</b>	<b>Cal. Until</b>
ESD Tester	TESEQ	NSG-437	1282	2025-08-02

### 3. General Product Information

#### 3.1 Product Function and Intended Use

The EUT is a IP67 Series IO-Link slave digital module used for industrial environments.

According to the client's declaration, the above models AU10 16DIOP-BUS, AU10 16DION-BUS, AU10 16DIOP-BUS-E, AU10 16DION-BUS-E, AU10 16DION-T, AU10 16DIOP-TE, AU10 16DION-TE, AU10 8DIOP-E, AU10 8DION-E, AU10 8DOPH, AU10 16DIOP, AU10 16DION, AU10 16DIOP-E, AU10 16DION-E, AU10 16DIOP-BUS-W, AU10 16DION-BUS-W, AU10 16DIOP-TW, AU10 16DION-TW, AU10 8DOPH-W, AU10 16DIOP-W, AU10 16DION-W are the same as the original ones AU10 16DIOP-T in circuit design, layout only difference them Software version target different sales markets.

For more information refer to the Instruction Manual.

#### 3.2 Ratings and System Details

Operating Voltage : DC 24V

Testing voltage: DC 24V

Protection class: III

\*Highest internal frequency: Fx < 108MHz

#### 3.3 Independent Operation Modes

The basic operation modes are:

- A. On
- B. Off

#### 3.4 Noise Generating and Noise Suppressing Parts

N/A

#### 3.5 Submitted Documents

- Rating Label

- Instruction Manual

## 4. Test Set-up and Operation Modes

### 4.1 Principle of Configuration Selection

**Emission:** The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

**Immunity:** The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

### 4.2 Test Operation and Test Software

Test operation refers to test setup in section 5 & 6. Pre-test in all operation modes, and find out the worst case for compliance test.

According to clause 3.1, all tests were performed on model AU10 16DIOP-T in this report.

### 4.3 Special Accessories and Auxiliary Equipment

N/A

### 4.4 Countermeasures to achieve EMC Compliance

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.



## 5. Test Results EMISSION

### 5.1 Emission in the Frequency Range above 30 MHz

#### 5.1.1 Radiated Emissions (Below 1GHz)

**RESULT:****Pass**

Date of testing : 2025-02-27  
Test standard : EN 55032:2015+A11+A1  
Frequency range : 30 - 1000MHz \*  
Classification : Class A  
Limits : Table A.4 of EN 55032:2015+A11+A1  
Kind of test site : 3m Semi-Anechoic Chamber  
Tested Port : Enclosure

**Test setup**

Input Voltage : DC 24V  
Operation Condition : According to clause 7.3 of CISPR 16-2-3:2016 & Annex D of EN 55032:2015+A11+A1  
Operation mode : A  
Earthing : Not connected  
Ambient temperature : Refer to Appendix 1  
Relative humidity : Refer to Appendix 1  
Atmospheric pressure : Refer to Appendix 1

Detailed test data refer to attached Appendix 1.

\* Remark: The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes, details refer to section 3.2.

- ☒ Highest frequency is less than 108MHz, measurement shall only be made up to 1GHz  
☐ Highest frequency is between 108 & 500MHz, measurement shall only be made up to 2GHz  
☐ Highest frequency is between 500 & 1GHz, measurement shall only be made up to 5GHz  
☐ Highest frequency is above 1GHz, measurement shall be made up to 5 times the highest frequency or 6GHz, whichever is less

**Method:** Measurements were made in a 3-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak detector below 1GHz) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

## 5.1.2 Radiated Emissions (Above 1GHz)

### Not Applicable

Date of testing	:	--
Test standard	:	EN 55032:2015+A11+A1
Frequency range	:	1 – 6GHz*
Classification	:	Class A
Limits	:	Table A.5 of EN 55032:2015+A11+A1
Kind of test site	:	3m Semi-Anechoic Chamber with RF absorber on the RGP
Tested Port	:	Enclosure

\* Remark: The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes, details refer to section 3.2.

- ☒ Highest frequency is less than 108MHz, measurement shall only be made up to 1GHz
- ☐ Highest frequency is between 108 & 500MHz, measurement shall only be made up to 2GHz
- ☐ Highest frequency is between 500 & 1GHz, measurement shall only be made up to 5GHz
- ☐ Highest frequency is above 1GHz, measurement shall be made up to 5 times the highest frequency or 6GHz, whichever is less

Method: Measurements were made in a 3-meter semi-anechoic chamber or Open Area Test Site that complies to CISPR 16. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3 meter below 1GHz and 3 meter above 1GHz. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in horizontal and vertical polarities. Final measurements (quasi-peak detector below 1GHz) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4 m. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

## 6. Test Results IMMUNITY

### 6.1 Classification of apparatus

According to EN 55035:2017+A11, the EUT shall be tested in accordance with clause 4 & 5, and comply with the performance criterion in table 1 of clause 5.

#### Continuous Disturbance

Continuous RF electromagnetic field disturbances swept test, spot test	<b>Criterion A</b>
Power Frequency Magnetic Fields *	<b>Criterion A</b>

#### Transient Disturbance

Electrostatic Discharges (ESD)	<b>Criterion B</b>
--------------------------------	--------------------

Remark:

\*The EUT do not contain devices susceptible to magnetic fields, therefore the Power-Frequency Magnetic Fields test is not necessary.

## 6.2 Continuous Disturbances

### 6.2.1 Continuous RF electromagnetic field disturbances, swept test

**RESULT:** Pass

Date of Testing : 2025-02-27  
Test Specification : EN 55035:2017+A11  
Basic Standard : IEC 61000-4-3:2006+A1+A2  
Criterion : A  
Frequency Range : 80 - 1000MHz  
Test Level : 3V/m (Unmodulated, r.m.s.)  
Modulation : AM 80%, 1kHz sine-wave  
Tested port : Enclosure

#### Test setup

Input Voltage : DC 24V  
Operation Mode : A  
Earthing : Not connected  
Ambient temperature : 23.2°C  
Relative humidity : 43.2%  
Atmospheric pressure : 101kPa

#### Test Result

Frequency Range	Polarization	Test Level (Unmodulated, rms)	Performance Criterion	Location	Result
80MHz to 1000MHz	Horizontal and Vertical	3V/m (rms)	A	Front/Rear/Left /Right	Pass
Remark: Operating as intended, no degradation detected during and after testing.					

## 6.2.2 Continuous RF electromagnetic field disturbances, spot test

**RESULT:** **Pass**

Date of Testing : 2025-02-27  
 Test Specification : EN 55035:2017+A11  
 Basic Standard : IEC 61000-4-3:2006+A1+A2  
 Criterion : A  
 Frequency Range : 1800MHz, 2600MHz, 3500MHz, 5000MHz  
 Test Level : 3V/m (Unmodulated, r.m.s.)  
 Modulation : AM 80%, 1kHz sine-wave  
 Tested port : Enclosure

### Test setup

Input Voltage : DC 24V  
 Operation Mode : A  
 Earthing : Not connected  
 Ambient temperature : 23.2°C  
 Relative humidity : 43.2%  
 Atmospheric pressure : 101kPa

### Test Result

Frequency	Polarization	Test Level (Unmodulated, rms)	Performance Criterion	Location	Result
1800MHz, 2600MHz, 3500MHz, 5000MHz	Horizontal and Vertical	3V/m (rms)	A	Front/Rear/Left /Right	Pass

Remark: Operating as intended, no degradation detected during and after testing.

## 6.3 Transient Disturbances

### 6.3.1 Electrostatic Discharges (ESD)

**RESULT:**

## Pass

Date of testing	:	2025-02-27
Test Specification	:	EN 55035:2017+A11
Basic Standard	:	IEC 61000-4-2:2008
Criterion	:	B
Charge voltage	:	±2kV, ±4kV, ±8kV (air discharge) ±4kV (contact discharge)
Number of discharges	:	>10

## Test Setup

Input Voltage	:	DC 24V
Operation Mode	:	A
Earthing	:	Not connected
Ambient temperature	:	23.0°C
Relative humidity	:	43.8%
Atmospheric pressure	:	101kPa

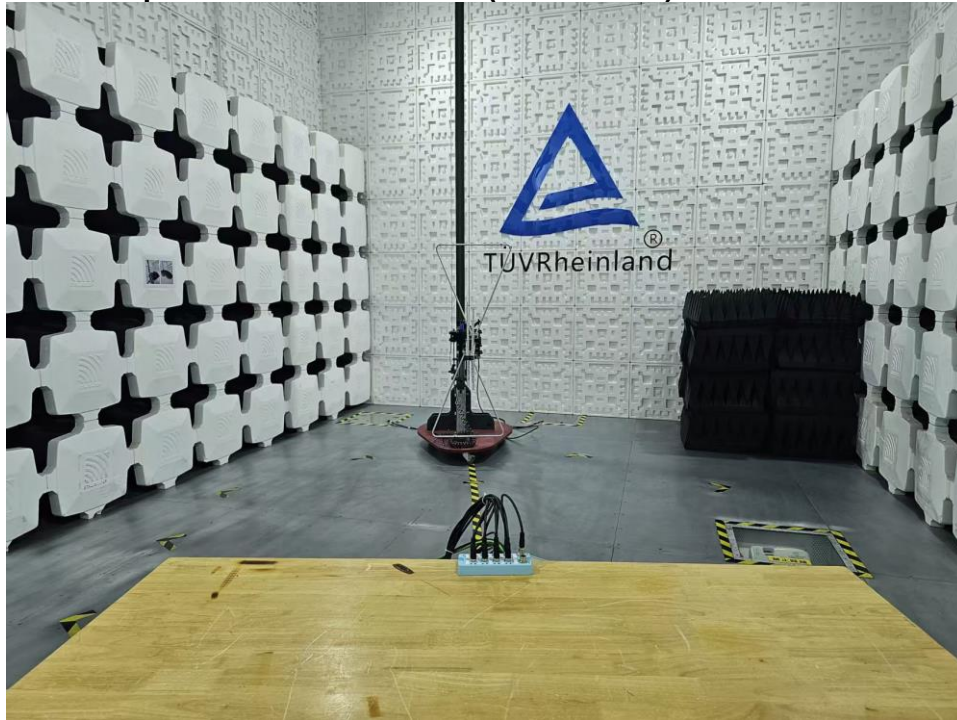
## Test Result

Test Point	Test Mode	Test Level (kV)	Performance Criterion	Description	Result
VCP	C	±4.0	B	No failure detected	Pass
HCP	C	±4.0	B	No failure detected	Pass
Shell	A	±2.0, ±4.0, +8.0	B	No failure detected	Pass

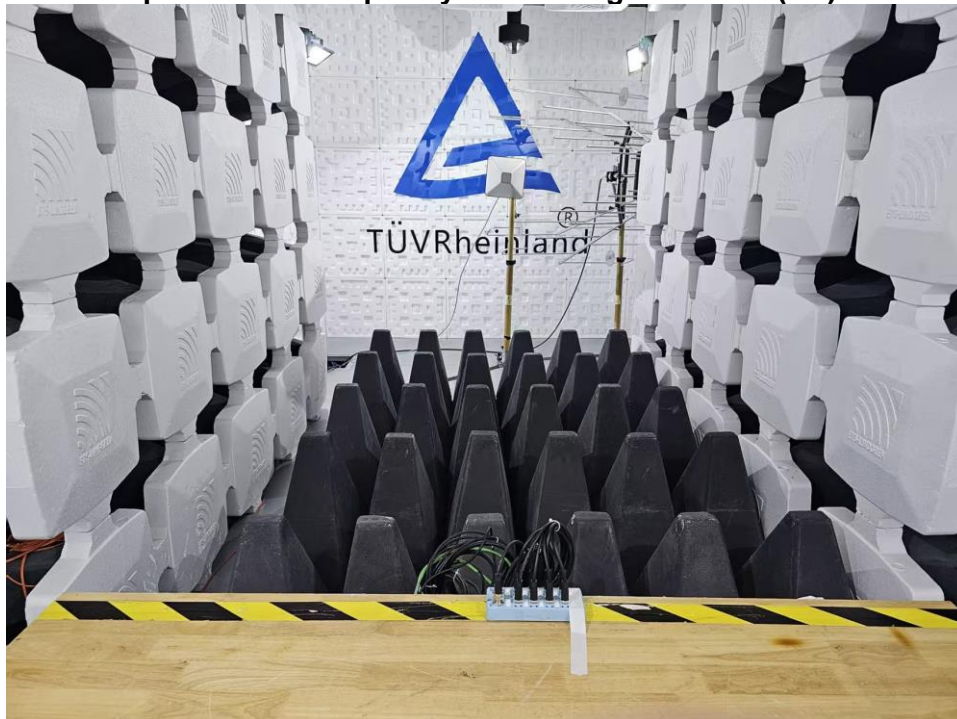
Note: A-Air discharge; C- Contact Discharge; VCP- Vertical Coupling Plane; HCP- Horizontal Coupling Plane

## 7. Photographs of the Test Set-Up

Photograph 1: Set-up for Radiated Emission (30-1000MHz)



Photograph 2: Set-up for Radio-Frequency Electromagnetic Field (RS) Below 1GHz

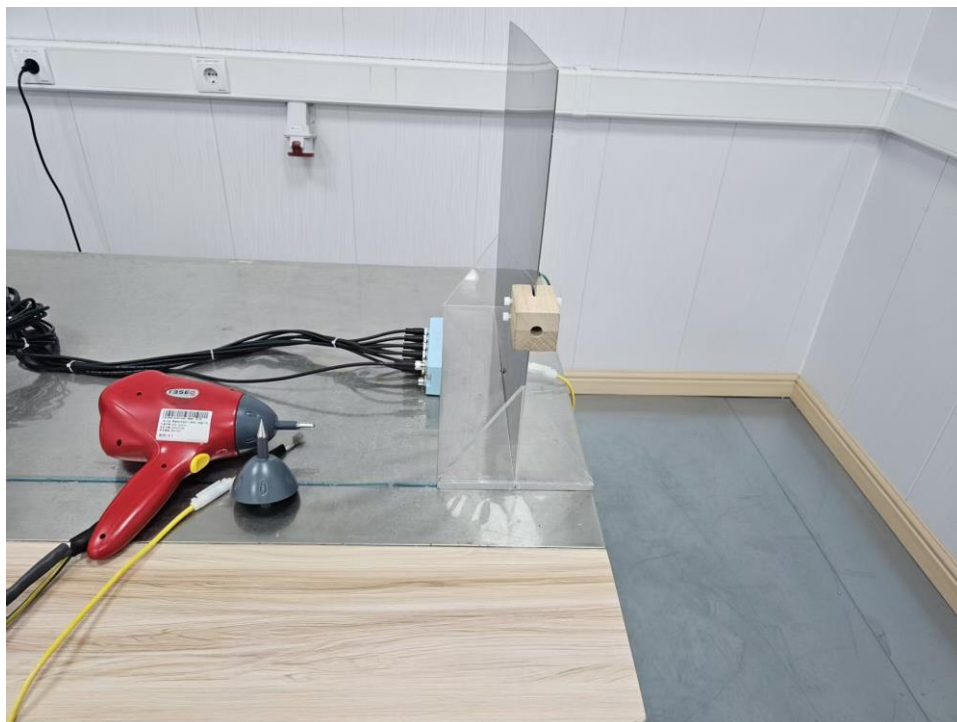




**Photograph 3: Set-up for Radio-Frequency Electromagnetic Field (RS) Above 1GHz**



**Photograph 4: Set-up for Electrostatic Discharges (ESD)**





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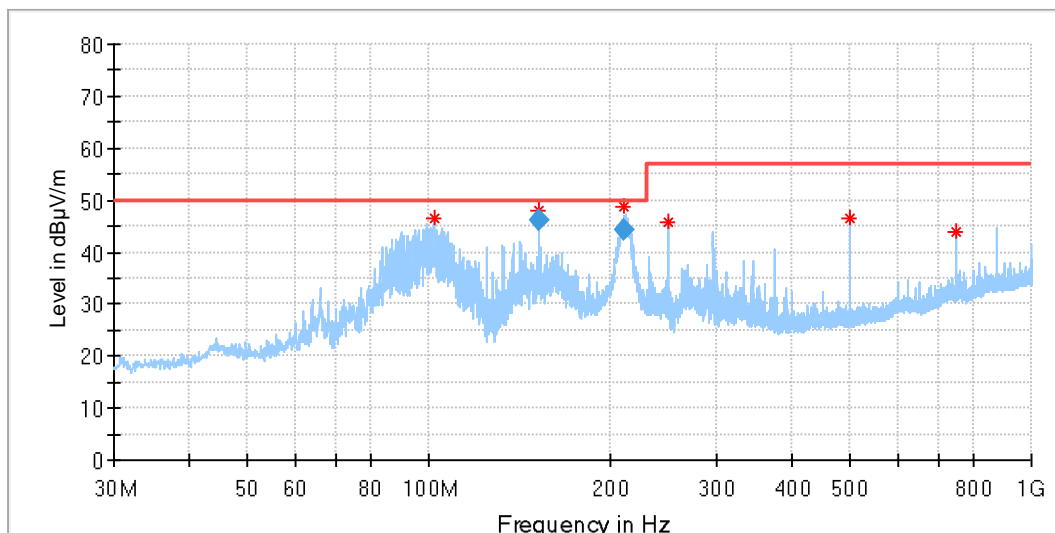
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## Appendix 1: Test Results of Radiated Emission

EUT Name: IP67 Series IO-Link slave digital module  
Order Number: 168530402  
Model: AUIO 16DIOP-T  
Test Mode: ON operation  
Test Voltage: DC24V  
Test Standard: EN 55032  
Test By:/Review By: Steve Lan/Shower Dai  
Tem./Hum./Pressure: 21.9°C/49.8%/101kPa  
Remark: 3m chamber



### Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
101.83	46.50	50.00	3.50	200.0	H	171.00	16.50
152.29	48.03	50.00	1.97	200.0	H	245.00	21.03
211.02	48.87	50.00	1.13	100.0	H	316.00	17.84
250.03	45.76	57.00	11.24	100.0	H	28.00	19.91
499.97	46.48	57.00	10.52	100.0	H	97.00	26.80
750.01	43.74	57.00	13.26	100.0	H	71.00	31.97

### Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth h (deg)	Corr. (dB/m)
152.29	46.06	50.00	3.94	1000.00	120.00	200.0	H	245.00	21.02
211.02	44.25	50.00	5.75	1000.00	120.00	100.0	H	316.00	17.83



## Measurement Uncertainties

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

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%.

**Table 1: Measurement Uncertainty levels**

Test	Parameters	Expanded uncertainty ( $U_{lab}$ )	Expanded uncertainty ( $U_{cispr}$ )
Radiated Emission (3m SAC)	Level accuracy (30MHz to 1000MHz)	$\pm 4.52$ dB	$\pm 6.3$ dB

As  $U_{lab}$  in all applicable tests listed above are less than  $U_{cispr}$  according to CISPR 16-4-2:2011,

- compliance is deemed to occur if no measured disturbance exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance exceeds the disturbance limit.

**END OF REPORT**