

Prüfbericht-Nr.: Test report no.:	CN25TA2Z 002	Auftrags-Nr.: Order no.:	168541455	Seite 1 von 8 Page 1 of 8
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2025-02-19	
Auftraggeber: Client:	Shenzhen HOPE Microelectronics Co., Ltd. 30th floor of 8th Building, C Zone, Vanke Cloud City, Xili Sub-district, Nanshan, Shenzhen, GD, P.R. China			
Prüfgegenstand: Test item:	LoRa Module			
Bezeichnung / Typ-Nr.: Identification / Type no.:	RFM6601			
Auftrags-Inhalt: Order content:	Test Report			
Prüfgrundlage: Test specification:	CFR47 FCC Part 2: Section 2.1093 FCC KDB Publication 447498 D01			
Wareneingangsdatum: Date of sample receipt:	2025-04-30	Please refer to Photo Document		
Prüfmuster-Nr.: Test sample no.:	A003986907-001-007 A003997948-001-002			
Prüfzeitraum: Testing period:	2025-05-29 - 2025-06-15			
Ort der Prüfung: Place of testing:	Refer to section 2.1			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:		genehmigt von: authorized by:		
Datum: Date:	2025-06-26 Signed by: Bell Hu	Ausstellungsdatum: Issue date:	2025-06-26 Signed by: Jonathan Li	
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position: Sachverständige(r)/Expert	
Sonstiges / Other:	FCC ID: 2ASEO-RFM6601 This report is under FCC C2PC application for the module integration into the Host (Product: Wireless Emergency-stop, Model: ES-W1-E, Manufacturer: Shanghai Zhiyuan New Innovation Technology Co., Ltd), the antennas changed and output power decreased.			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged			
* Legende:	P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet			
* Legend:	P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested			
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. <i>This test report only relates to the above mentioned 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>				

Prüfbericht-Nr.: CN25TA2Z 002
Test report no.:

Seite 2 von 8
Page 2 of 8

Anmerkungen
Remarks

1	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>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. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i>
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3	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>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i> <i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i>
4	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 115:2023, 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>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 115:2023, 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.</i>

Prüfbericht - Nr.: CN25TA2Z 002
Test Report No.:

Seite 3 von 8
Page 3 of 8

TEST SUMMARY

3.1.1 RF EXPOSURE COMPLIANCE
RESULT: Pass

Contents

1.	TEST SITES.....	5
1.1	TEST FACILITIES	5
1.2	TRACEABILITY	5
1.3	CALIBRATION.....	5
1.4	LOCATION OF ORIGINAL DATA	5
1.5	STATUS OF FACILITY USED FOR TESTING	5
2.	GENERAL PRODUCT INFORMATION	6
2.1	GENERAL DESCRIPTION	6
2.2	RATING AND SYSTEM DETAILS.....	6
3.	TEST RESULTS	7
3.1	TRANSMITTER REQUIREMENTS & TEST SUITES.....	7
3.1.1	RF Exposure Compliance.....	7

1. Test Sites

1.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

2-3F, 101 & 102, No.2, Nuclear Power Industrial Park, Fuming Community, Fucheng Street, Longhua District, Shenzhen 518000, People's Republic of China

FCC Accreditation Designation No.: CN1260

ISED wireless device testing laboratory: 25069

1.2 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

1.3 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

1.4 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendixes of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

1.5 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. facility located at 2-3F, 101 & 102, No.2, Nuclear Power Industrial Park, Fuming Community, Fucheng Street, Longhua District, Shenzhen 518000, People's Republic of China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

2. General Product Information

2.1 General Description

The product is Lora module, which supports 915MHz Band Lora wireless function.

This report is under FCC C2PC application for the module integration into the Host (Product: Wireless Emergency-stop, Model: ES-W1-E, Manufacturer: Shanghai Zhiyuan New Innovation Technology Co., Ltd), the antennas changed and output power decreased for SAR exemption. The related items got re-tested.

2.2 Rating and System Details

Table 1: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	LoRa Module
Type Designation	RFM6601
FCC ID	2ASEO-RFM6601
Operating Voltage	3.3V
Technical Specification of LoRa FHSS	
Operating Frequency:	902.3-914.9MHz
Type of Modulation:	CSS
Channel Number:	63 channels
Channel Separation:	0.2MHz
Antenna Type:	Integral Antenna
Antenna Gain:	2 dBi (Provided by the Client)
Technical Specification of LoRa DTS	
Operating Frequency	903-914MHz (Uplink) 923.3- 927.5MHz (Downlink)
Type of Modulation	CSS
Channel Number	7 channels
Channel Separation	1.6 MHz
Antenna Type	Integral Antenna
Antenna Number	1Tx1Rx
Antenna Gain	2 (Provided by the Client)

Table 2: Technical Specification of Host

General Information	Description
Kind of Equipment:	Wireless Emergency-stop
Type Designation:	ES-W1-E
Operating Voltage:	3.6V DC Battery Powered
Testing Voltage:	3.6V DC Battery Powered
Manufacturer:	Shanghai Zhiyuan New Innovation Technology Co., Ltd

Note: This Wireless Emergency-stop is for Robot remote control, normally hand-held use.

Prüfbericht - Nr.: CN25TA2Z 002
Test Report No.:

Seite 7 von 8
Page 7 of 8

3. Test Results

3.1 Transmitter Requirements & Test Suites

3.1.1 RF Exposure Compliance

RESULT:

Pass

Test standard : CFR47 FCC Part 2: Section 2.1093
FCC KDB 447498 D01 General RF Exposure Guidance v06

FCC Part 1.1310, Part 2.1093, KDB 447498 D01 General RF Exposure Guidance v06
Appendix A)
SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	SAR Test Exclusion Threshold (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	
MHz	30	35	40	45	50	mm
150	232	271	310	349	387	SAR Test Exclusion Threshold (mW)
300	164	192	219	246	274	
450	134	157	179	201	224	
835	98	115	131	148	164	
900	95	111	126	142	158	
1500	73	86	98	110	122	
1900	65	76	87	98	109	
2450	57	67	77	86	96	
3600	47	55	63	71	79	
5200	39	46	53	59	66	
5400	39	45	52	58	65	
5800	37	44	50	56	62	

Note: 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above. These thresholds do not apply, by extrapolation or other means, to occupational exposure limits.

Table 3: Test Results of RF Exposure Calculations for FCC, Stand-alone mode

Test Mode	Output Power (including Tune-up tolerance)		Pmax in Annex A (note 1) (mW)	Result
	(dBm)	(mW)		
915MHz Band	14	25.2	40	Pass

Note: 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g SAR Test Exclusion Thresholds indicated above.

Report End