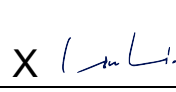


Prüfbericht-Nr.: <i>Test report no.:</i>	CN25631H 003	Auftrags-Nr.: <i>Order no.:</i>	168500372	Seite 1 von 10 Page 1 of 10
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2025-06-26	
Auftraggeber: <i>Client:</i>	Shenzhen RAKwireless Technology Co.,Ltd. Room 506, Building B, New Compark, Pingshan First Road, Taoyuan Street, Nanshan District, Shenzhen, Guangdong, P.R. China			
Prüfgegenstand: <i>Test item:</i>	WisGate X Industrial			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	RAK7437C (Trademark: )			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR Title 47 FCC Part 1.1310 CFR Title 47 FCC Part 2.1091 RSS-102 Issue 6 December 2023			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-06-26	Please refer to Photo Document		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A004010991-007			
Prüfzeitraum: <i>Testing period:</i>	2025-06-26 - 2025-08-04			
Ort der Prüfung: <i>Place of testing:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: <i>Test result*:</i>	Pass			
geprüft von: <i>tested by:</i>	 Hardy Suo		genehmigt von: <i>authorized by:</i>	 Lin Lin
Datum: <i>Date:</i>	2025-08-15		Ausstellungsdatum: <i>Issue date:</i>	2025-08-15
Stellung / Position:	Sachverständige(r)/Expert		Stellung / Position:	Sachverständige(r)/Expert
Sonstiges / Other:	FCC ID: 2AF6B-RAK7437C, IC: 25908-RAK7437C HVIN: RAK7437C			
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>	Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>			
* 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>				

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Test report no.:

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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 115:2021, 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>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.</i>

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Test Report No.:

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Test Summary

3.1.1 RF EXPOSURE COMPLIANCE
RESULT: Pass

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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 Test Site Number: CN1260

ISED Test Lab CAB identifier:CN0078

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. Test 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 EUT is a WisGate X Industrial which supports Lora, 2.4GHz Wi-Fi and WCDMA/LTE wireless technologies.

Contains FCC ID: 2AF6B-RAK5146, XMR201807EG95NA.

Contains IC: 25908-RAK5146, 10224A-2018EG95NA.

Remark:

- 1) This product assembles a Lora Module (M/N: RAK5146) without change than it was approved except disabled GNSS function by RAK via firmware
- 2) This product assembles a LTE module (M/N: EG95-NA) without change than it was approved except a new LTE dipole antenna (PN: SW19073EB56) with lower antenna gain

This report is for EMF evaluation on 2.4GHz Wi-Fi and;
this report is also for FCC CIIPC and ISED C4PC as multi-wireless modules installed into HOST WisGate X Industrial (M/N: RAK7437C), EMF evaluation for co-location were re-performed.

For details refer to the User Manual, Technical Description and Circuit Diagram.

2.2 Rating and System details

Table 1: Technical Specification of EUT

General Information of EUT	Description
Kind of Equipment:	WisGate X Industrial
Type Designation:	RAK7437C
HVIN:	RAK7437C
Operating Voltage:	DC 9-36V or DC 48V via POE adapter
Testing Voltage:	AC 120V, 60Hz
Operating Temperature Range:	-20 °C ~ +55 °C
AC/DC Adapter:	Model: AD-0241200200US-3 Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 12V. 2A, 24W Factory: Shenzhen AMC Technology Co., Ltd.
Remark: This product assembles multi-transmitter modules:	
- LTE Module (FCC ID: XMR201807EG95NA, IC: 10224A-2018EG95NA) - LoRa Concentrator Module (FCC ID: 2AF6B-RAK5146, IC: 25908-RAK5146)	
Technical Specification of 2.4GHz Wi-Fi	
Characteristic	Description
Operating Frequency	2412 - 2462 MHz for 802.11b/g/n(HT20)/ax(HE20) 2422 - 2452 MHz for 802.11n(HT40)/ax(HE40)
Type of Modulation	DSSS(DBPSK/DQPSK/CCK) OFDM(BPSK/QPSK/16QAM/64QAM)

Data Rate:	1/2/5.5/11 Mbps for 802.11b 6/9/12/18/24/36/48/54 Mbps for 802.11g MCS0-MCS15 for 802.11n(HT20)/ax(HE20) MCS0-MCS15 for 802.11n(HT40)ax(HE40)
Channel Number:	11 channels for 802.11b/g/n(HT20) 9 channels for 802.11n(HT40)
Multit-RU:	No, full RU
Antenna Number:	2
Antenna Gain:	1.5dBi (declared by client)
Technical Specification of Contained WisLink LPWAN Concentrator	
Characteristic	Description
Operating Frequency	923.3 - 927.5MHz for DTS LoRa 903.9 - 905.3MHz for Hybrid LoRa
Type of Modulation	FSK/LoRa
Data Rate:	Lora: SF7 – SF12 / DR8 – DR13, SF7 – SF10 / DR0 –DR3
Antenna Number:	1
Antenna Gain:	Dipole Antenna (M/N: RAKARJ16) with 2.3dBi (declared by client)
Model of contained Lora Module:	RAK5146
FCC ID	2AF6B-RAK5146
IC ID	25908-RAK5146
Technical Specification of Contained LTE Module	
Characteristic	Description
Operating Frequency	WCDMA Band: II, IV, V LTE Band: 2, 4, 5, 12, 13
Type of Modulation	QPSK, 16QAM
Power Class	4
Antenna Number:	2 (1 for MAIN, 1 for DIV)
Antenna Gain:	824MHz: 1.58dBi 960MHz: 2.65dBi 1200MHz: -0.75dBi 1575MHz: 1.87dBi 1710MHz: 1.25dBi 2690MHz: 0.99dBi (declared by client)
Model of contained LTE module:	EG95-NA
FCC ID	XMR201807EG95NA
IC ID	10224A-2018EG95NA

3. Test Results

3.1 RF Exposure Evaluation

3.1.1 RF Exposure Compliance

RESULT:
Pass

Test standard : CFR Title 47 FCC Part 2.1091
RSS-102 Issue 6
KDB 447498 D01 General RF Exposure Guidance v06

Limit : Table 1 of CFR Title 47 FCC Part 1.1310
Section 6.6 of RSS-102 Issue 6

3.1.1.1 RF Exposure Compliance Requirement

a) Radio Frequency Exposure Limit

For FCC:

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Average Time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	<6
3.0-30	1842/f	4.89/f	*(900/f ²)	<6
30-300	61.4	0.163	1.0	<6
300-1,500	--	--	f/300	<6
1,500-100,000	--	--	1.0	<6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-3.0	614	1.63	*100	<30
3.0-30	824/f	2.19/f	*(180/f ²)	<30
30-300	27.5	0.073	0.2	<30
300-1,500	--	--	f/1500	<30
1,500-100,000	--	--	1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

For IC:

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	0.73/ <i>f</i>	-	6**
1.1-10	87/ <i>f</i> ^{0.5}	-	-	6**
10-20	27.46	0.0728	2	6
20-48	58.07/ <i>f</i> ^{0.25}	0.1540/ <i>f</i> ^{0.25}	8.944/ <i>f</i> ^{0.5}	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 <i>f</i> ^{0.3417}	0.008335 <i>f</i> ^{0.3417}	0.02619 <i>f</i> ^{0.6834}	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ <i>f</i> ^{1.2}
150000-300000	0.158 <i>f</i> ^{0.5}	4.21 x 10 ⁻⁴ <i>f</i> ^{0.5}	6.67 x 10 ⁻⁵ <i>f</i>	616000/ <i>f</i> ^{1.2}

Note: *f* is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

b) Radio Frequency Exposure Calculation Formula

$$S = \frac{PG}{4\pi R^2}$$

where: S = power density (in appropriate units, e.g. mW/cm²)
P = power input to the antenna (in appropriate units, e.g., mW)
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

or:

$$S = \frac{EIRP}{4\pi R^2}$$

where: EIRP = equivalent (or effective) isotropically radiated power

c) RF Exposure Calculation, stand-alone mode

Mode	Band	PG (dBm)	PG (mW)	Power Density (mW/cm ²)	FCC Limit (mW/cm ²)
Lora	902-928MHz	26.99	500.03	0.0995	0.601
WIFI	2.4GHz	25.40	346.74	0.0690	1.0
WCDMA	II	27.65	582.10	0.1159	1.0
	VI	27.65	582.10	0.1159	1.0
	V	27.65	582.10	0.1159	0.55
LTE	2	27.65	582.10	0.1159	1.0
	4	27.65	582.10	0.1159	1.0
	5	27.65	582.10	0.1159	0.55
	12	27.65	582.10	0.1159	0.47
	13	27.65	582.10	0.1159	0.52

Mode	Band	PG (dBm)	PG (W)	Power Density (W/m ²)	IC Limit (W/m ²)
Lora	902-928MHz	26.99	0.50	0.9953	2.74
WIFI	2.4GHz	25.40	0.35	0.6902	5.35
WCDMA	II	27.65	0.58	1.1586	4.48
	VI	27.65	0.58	1.1586	4.24
	V	27.65	0.58	1.1586	2.58
LTE	2	27.65	0.58	1.1586	4.48
	4	27.65	0.58	1.1586	4.24
	5	27.65	0.58	1.1586	2.58
	12	27.65	0.58	1.1586	2.30
	13	27.65	0.58	1.1586	2.47

Note:

- Output power for Lora, refer to test report CN21AUGI 001 (issued by TÜV Rheinland (Shenzhen) Co., Ltd.) with FCC ID: 2AF6B-RAK5146, IC: 25908-RAK5146
- Output power for LTE:
 - refer to test reports R1805A0249-R1, R1805A0249-R2, R1805A0249-R3, R1805A0249-M1V1 (issued by TA Technology (Shanghai) Co., Ltd.) with FCC ID: XMR201807EG95NA
 - refer to test reports R1805A0249-R4V1, R1805A0249-R5V1, R1805A0249-R6V1, R1805A0249-M2V1 (issued by TA Technology (Shanghai) Co., Ltd.) with IC: 10224A-2018EG95NA

d) Simultaneous transmission MPE

FCC						
Operating Mode	Lora	WIFI	WCDMA/LTE	Sum Ratio	Limit	Verdict
Lora + WIFI + WCDMA/LTE	0.17	0.07	0.25	0.49	<1	Pass
IC						
Operating Mode	Lora	WIFI	WCDMA/LTE	Sum Ratio	Limit	Verdict
Lora + WIFI + WCDMA/LTE	0.36	0.13	0.50	0.99	<1	Pass

e) Conclusion

Therefore the maximum calculations result of above are meet the requirement of Radio Frequency Exposure (MPE) limit. This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons.