

Prüfbericht-Nr.: <i>Test report no.:</i>	CN25GRZG 001	Auftrags-Nr.: <i>Order no.:</i>	168500372	Seite 1 von 13 Page 1 of 13
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>	RAK7437 (Trademark: RAK)			
Auftrags-Inhalt: <i>Order content:</i>	Test Report			
Prüfgrundlage: <i>Test specification:</i>	CFR Title 47 FCC Part 15.107 CFR Title 47 FCC Part 15.109 ICES-003 Issue 7 October 2020			
Wareneingangsdatum: <i>Date of sample receipt:</i>	2025-06-26	Refer to photos documents		
Prüfmuster-Nr.: <i>Test sample no.:</i>	A004010991-001			
Prüfzeitraum: <i>Testing period:</i>	2025-06-26 - 2025-07-28			
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 <i>Suo</i>	genehmigt von: <i>authorized by:</i>	Lin <i>Lin</i>	
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 / <i>Other:</i>	FCC ID: 2AF6B-RAK7437			
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 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>				

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Anmerkungen Remarks

- | | |
|----------|--|
| 1 | <p>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.</p> <p>Detaillierte Informationen bezüglich Prüfkonditionen, Prüfequipment und Messunsicherheiten sind im Prüflabor vorhanden und können auf Wunsch bereitgestellt werden.</p> <p><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.</i></p> <p><i>Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p> |
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| 3 | <p>Prüfklausel mit der Note * wurden an qualifizierte Unterauftragnehmer vergeben und sind unter der jeweiligen Prüfklausel des Berichts beschrieben.</p> <p>Abweichungen von Prüfspezifikation(en) oder Kundenanforderungen sind in der jeweiligen Prüfklausel im Bericht aufgeführt.</p> <p><i>Test clauses with remark of * are subcontracted to qualified subcontractors and described under the respective test clause in the report.</i></p> <p><i>Deviations of testing specification(s) or customer requirements are listed in specific test clause in the report.</i></p> |
| 4 | <p>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.</p> <p><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></p> |

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Test Summary

5.1 Conducted emissions

RESULT: Pass

5.2 Radiated emissions

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 A: Test Result.

Appendix B: Test Setup Photos.

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 518000, People's Republic of China

A2LA Certificate Number: 5162.01

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Conducted Emission on AC Mains				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102428	2026-07-18
Artificial Mains Network	R&S	ENV432	101546	2026-02-09
Artificial Mains Network	R&S	ENV432	101411	2026-07-18
Impedance Stabilisation Network	R&S	ENY81	100323	2026-05-15
Shield Cable (9k-30MHz)	N/A	N/A	N/A	2025-12-20
EMC32 test software	R&S	EMC32 (Ver.10.50.00)	N/A	N/A
Radiated Emission (3m chamber)				
Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
3m SAC	ETS-Lindgren	SAC3	CT001632-Q1362	2027-09-11
EMI Test Receiver	R&S	ESR7	102111	2026-07-18
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	0945	2026-07-18
Horn Antenna	R&S	HF907	102706	2025-09-01
Preamplifier (9kHz-18GHz)	R&S	SCU-18F	180076	2025-10-11
Preamplifier (1-18GHz)	R&S	SCU-18F	180076	2025-10-11
Shield Cable #1 (9kHz-1GHz)	N/A	N/A	N/A	2025-12-20
Shield Cable #1 (9kHz-18GHz)	N/A	N/A	N/A	2025-12-14

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EMC32 test software	R&S	EMC32(Ver.10.60.20)	N/A	N/A
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2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 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.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Parameter	Uncertainty
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	± 3.70 dB / ± 3.30 dB
Radiated Emission (3m SAC), 30MHz to 1000MHz	± 4.52 dB
Radiated Emission (3m SAC), above 1000MHz	± 4.37 dB
Radiated Emission (10m SAC), 30MHz to 1000MHz	± 4.66 dB
Radiated Emission (10m SAC), above 1000MHz	± 4.35 dB

2.6 Location of Original Data

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

2.7 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.

3 General Product Information

3.1 Product Function and Intended Use

The EUT is a WisGate X Industrial which supports Lora and 2.4GHz Wi-Fi wireless technologies.

This device contains two approved modules with FCC ID: 2AF6B-RAK5146.

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

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	WisGate X Industrial
Type Designation:	RAK7437
Operating Voltage:	DC 9-36V or DC 48V via POE adapter
Testing Voltage:	AC 120V, 60Hz (Power supply to POE adapter or external AC/DC adapter)
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.

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, normal operation powered by DC port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
- B. On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- Block Diagram

- Photo Document

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- Schematics

- User 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.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.4: 2014.

According to clause 3.1, all test were applied on model RAK7437 in this report.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Remark
Portable Laptop	Lenovo	ThinkPad T480	10Q67059	N/A
Gigabit Managed PoE Switch	TP-LINK	TL-SG2218P	N/A	N/A
USB 3.0 HD	SSK	HE-V300	N/A	N/A
POE adapter	RAK	R012-4800500	N/A	Input: AC 100-240V, 50/60Hz, 0.6A Output: DC 48V. 0.5A, 24W
Light sensor	jiuzhou	JZ-GZ	N/A	N/A
WisGate	RAK	RAK7268V2	N/A	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 Technical Construction File (TCF). No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

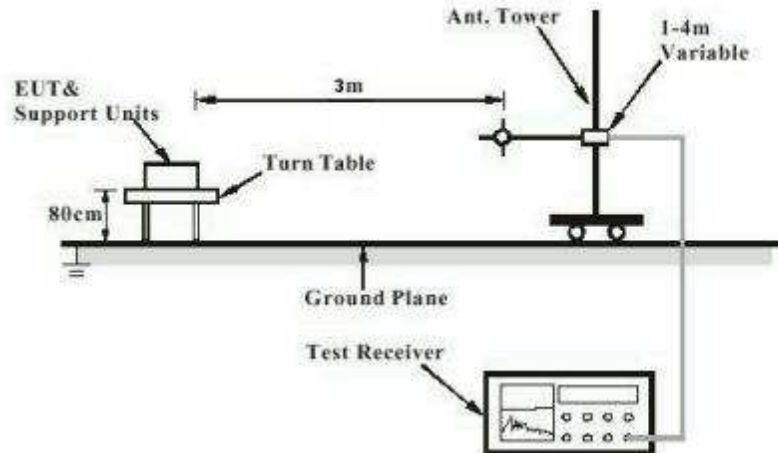


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

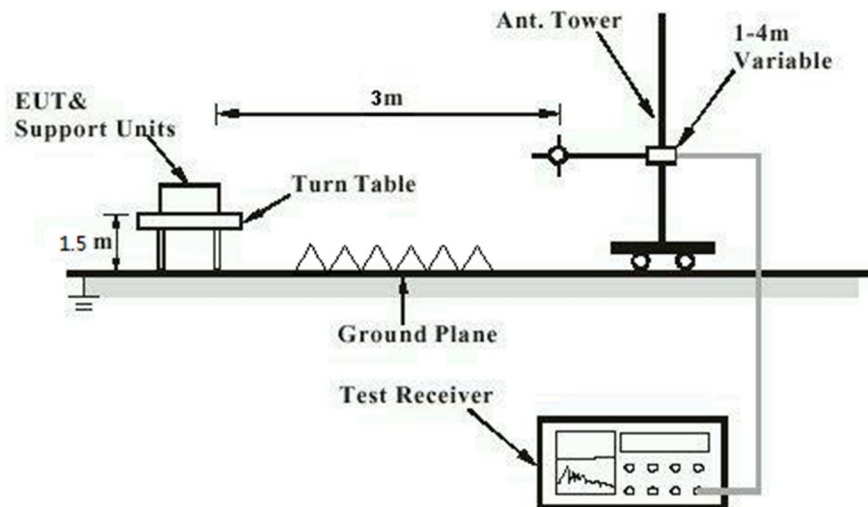
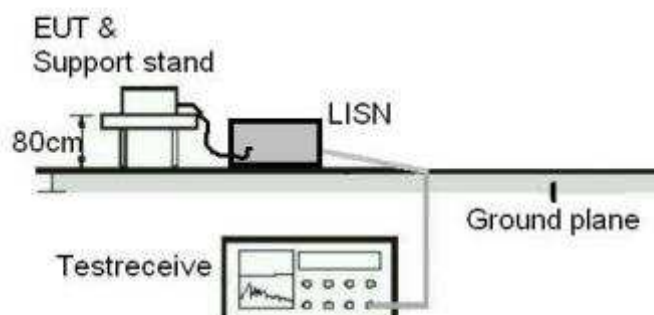


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1 Conducted Emissions

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.107(a) ICES-003 Issue 7, Clause 3.2.1
Basic standard	: ANSI C63.4: 2014
Frequency range	: 150KHz - 30MHz
Classification	: Class B
Limit	: FCC Part 15.107(a) & ICES-003 Table 1
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2025-06-26 - 2025-07-28
Input voltage	: AC 120V, 60Hz
Operation mode	: A, B
Earthing	: Not Connected
Ambient temperature	: Refer to test data
Relative humidity	: Refer to test data
Atmospheric pressure	: 101 kPa

For the measurement records, refer to appendix A.

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5.2 Radiated Emission

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.109(a) ICES-003 Issue 7, Clause 3.2.2
Basic standard	: ANSI C63.4: 2014
Frequency range	: 30MHz to 5 th highest fundamental frequency
Classification	: Class B
Limit	: FCC Part 15.109(a) ICES-003 Table 2 & Table 4
Kind of test site	: 3m Semi-anechoic Chamber & 3m Full-anechoic Chamber

Test Setup

Date of testing	: 2025-06-26 - 2025-07-28
Input voltage	: AC 120V, 60Hz
Operation mode	: A, B
Earthing	: Not Connected
Ambient temperature	: Refer to test data
Relative humidity	: Refer to test data
Atmospheric pressure	: 101 kPa

For the measurement records, refer to appendix A.

Remark 1: The limit of below radiated emission test data is from FCC part 15.109, it also meet the limit of ICES-003 issue 7.

6 List of Tables

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Appendix A

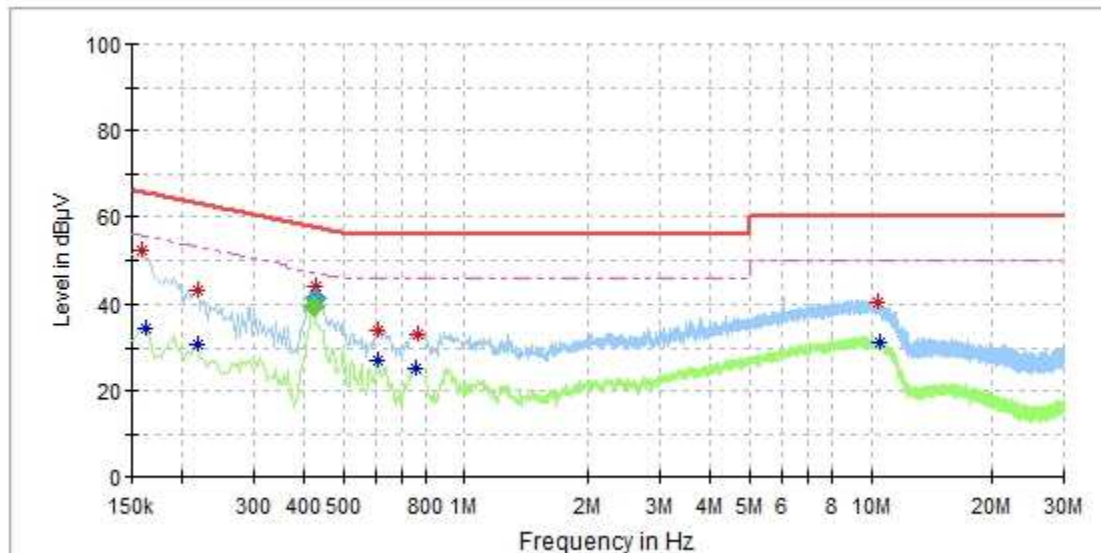
Test Results

1	APPENDIX A.1: TEST PLOTS OF CONDUCTED EMISSIONS	2
2	APPENDIX A.2: TEST PLOTS OF RADIATED EMISSIONS, BELOW 1GHZ.....	6
3	APPENDIX A.3: TEST PLOTS OF RADIATED EMISSIONS, ABOVE 1GHZ.....	10

1 Appendix A.1: Test Plots of Conducted Emissions

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372 60(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by DC port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 24.9°C/50.4%/101kPa
Remark: SR3



Critical Freqs

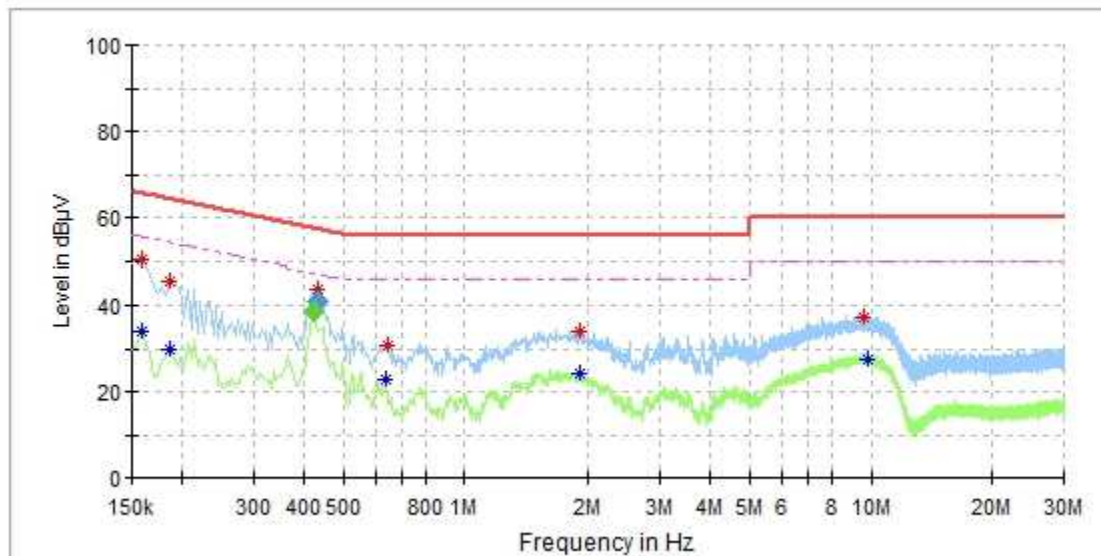
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.158000	52.09	---	65.57	13.48	L1	10
0.162000	---	34.63	55.36	20.73	L1	10
0.218000	---	30.66	52.90	22.24	L1	10
0.218000	43.37	---	62.90	19.53	L1	10
0.421500	---	39.42	47.49	8.06	L1	10
0.426500	44.02	---	57.41	13.38	L1	10
0.606000	---	26.98	46.00	19.02	L1	10
0.610000	34.16	---	56.00	21.84	L1	10
0.758000	---	25.19	46.00	20.81	L1	10
0.762000	33.24	---	56.00	22.76	L1	10
10.422000	40.37	---	60.00	19.63	L1	10
10.530000	---	31.36	50.00	18.64	L1	10

Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.421500	---	39.58	47.42	7.84	1000.0	9.000	L1	10
0.426500	41.59	---	57.32	15.73	1000.0	9.000	L1	10

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372 60(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by DC port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 24.9°C/50.4%/101kPa
Remark: SR3



Critical_Freqs

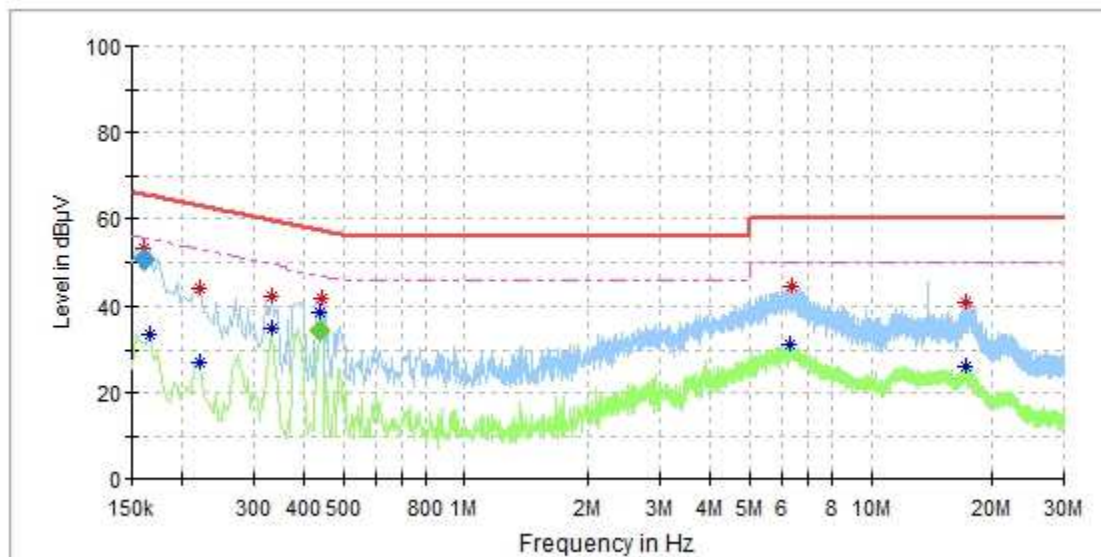
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.158000	---	33.96	55.57	21.61	N	10
0.158000	50.30	---	65.57	15.27	N	10
0.186000	---	29.95	54.21	24.27	N	10
0.186000	45.50	---	64.21	18.72	N	10
0.421500	---	38.86	47.41	8.55	N	10
0.434500	43.59	---	57.25	13.66	N	10
0.634000	---	22.62	46.00	23.38	N	10
0.642000	30.90	---	56.00	25.10	N	10
1.894000	---	24.36	46.00	21.64	N	10
1.898000	34.15	---	56.00	21.85	N	10
9.646000	37.23	---	60.00	22.77	N	10
9.850000	---	27.37	50.00	22.63	N	10

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.421500	---	38.78	47.42	8.64	1000.0	9.000	N	10
0.434500	40.98	---	57.17	16.19	1000.0	9.000	N	10

EUT Information

EUT Name: WisGate X Industrial
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Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 24.9°C/50.4%/101kPa
Remark: SR3



Critical_Freqs

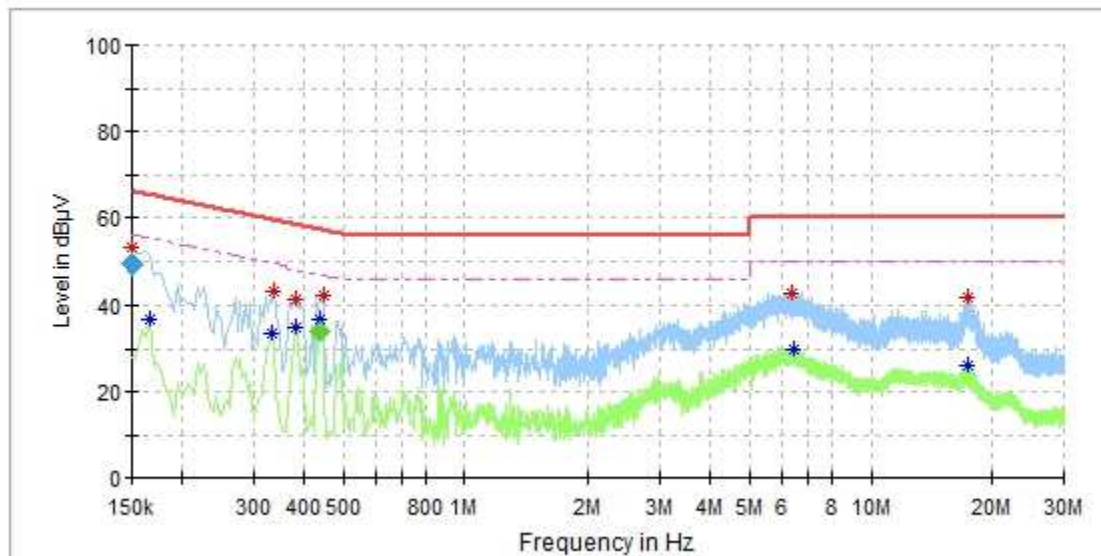
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.161500	53.10	---	65.16	12.06	L1	10
0.166000	---	33.42	55.16	21.74	L1	10
0.222000	---	27.18	52.74	25.57	L1	10
0.222000	44.35	---	62.74	18.39	L1	10
0.334000	---	34.83	49.35	14.52	L1	10
0.334000	42.37	---	59.35	16.98	L1	10
0.437500	---	38.51	47.02	8.51	L1	10
0.442000	41.99	---	57.02	15.03	L1	10
6.330000	---	30.99	50.00	19.01	L1	10
6.346000	44.42	---	60.00	15.58	L1	10
17.206000	41.15	---	60.00	18.85	L1	10
17.258000	---	26.22	50.00	23.78	L1	10

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.161500	50.85	---	65.39	14.54	1000.0	9.000	L1	10
0.437500	---	34.32	47.11	12.79	1000.0	9.000	L1	10

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372 60(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
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Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 24.9°C/50.4%/101kPa
Remark: SR3



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.150000	52.85	---	66.00	13.15	N	10
0.166000	---	36.77	55.16	18.39	N	10
0.334000	---	33.36	49.35	15.99	N	10
0.338000	43.48	---	59.25	15.77	N	10
0.382000	41.43	---	58.24	16.81	N	10
0.382000	---	35.10	48.24	13.14	N	10
0.437500	---	36.75	47.10	10.35	N	10
0.446000	42.51	---	56.95	14.44	N	10
6.394000	42.57	---	60.00	17.43	N	10
6.418000	---	29.72	50.00	20.28	N	10
17.406000	---	26.19	50.00	23.81	N	10
17.446000	42.04	---	60.00	17.96	N	10

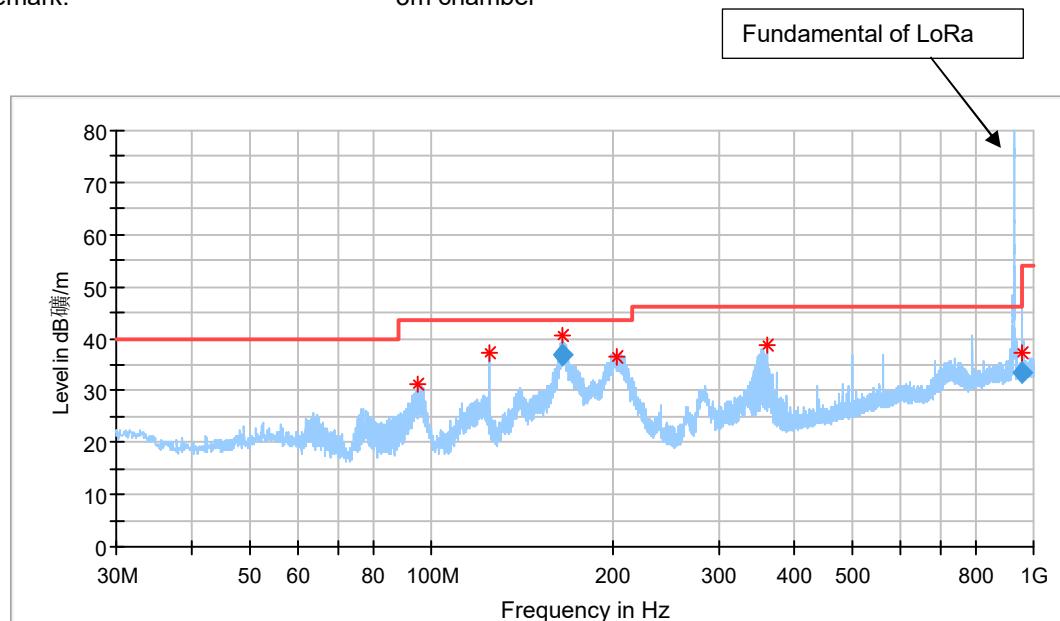
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	49.25	---	66.00	16.75	1000.0	9.000	N	10
0.437500	---	34.00	47.11	13.11	1000.0	9.000	N	10

2 Appendix A.2: Test Plots of Radiated Emissions, below 1GHz

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By./Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 23.6°C/51.5%/101kPa
Remark: 3m chamber



Critical_Freqs

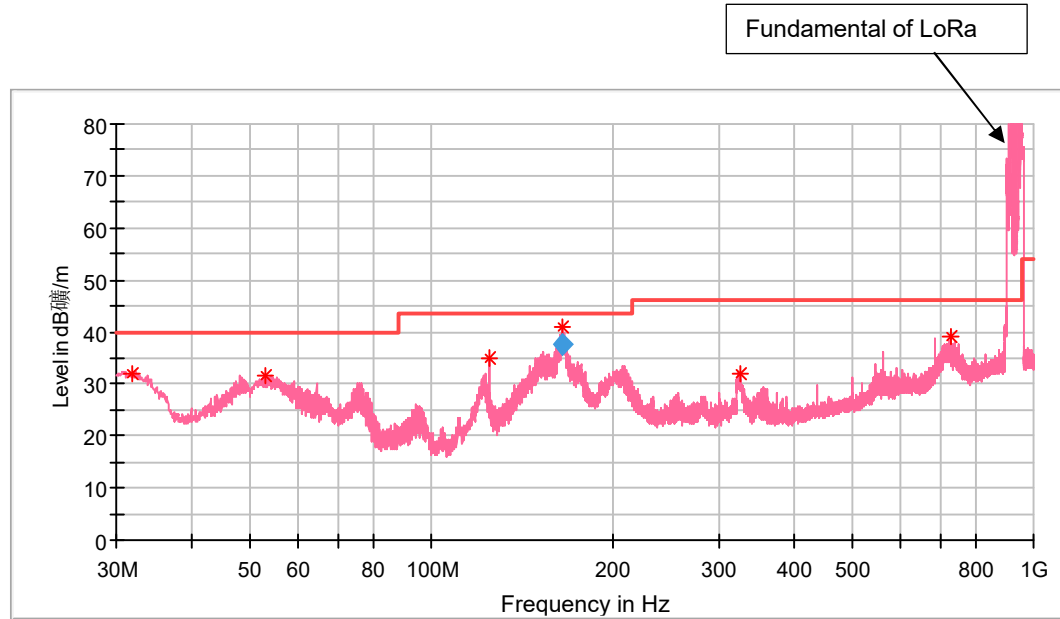
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
94.77	31.28	43.50	12.22	200.0	H	15.00	15.32
124.95	37.06	43.50	6.45	200.0	H	170.00	18.79
165.18	40.68	43.50	2.82	200.0	H	42.00	20.66
203.41	36.54	43.50	6.96	200.0	H	321.00	17.46
360.02	38.52	46.00	7.48	100.0	H	11.00	22.86
960.01	37.12	54.00	16.88	200.0	H	92.00	33.71

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)
165.18	36.80	43.50	6.70	1000.00	120.00	200.0	H	42.00	20.66
960.01	33.59	54.00	20.41	1000.00	120.00	200.0	H	92.00	33.71

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 23.6°C/51.5%/101kPa
Remark: 3m chamber



Critical Freqs

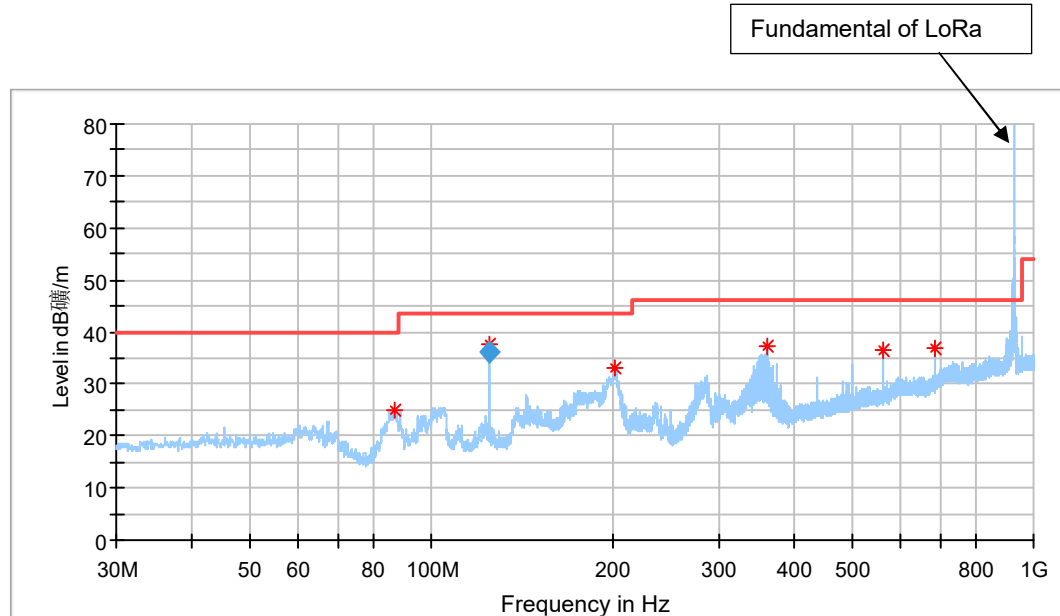
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
31.89	32.11	40.00	7.89	100.0	V	24.00	18.96
52.90	31.45	40.00	8.55	100.0	V	319.00	20.64
124.95	35.04	43.50	8.46	100.0	V	184.00	18.79
165.29	41.04	43.50	2.46	100.0	V	36.00	20.66
325.26	32.17	46.00	13.83	100.0	V	230.00	22.24
727.86	39.01	46.00	6.99	100.0	V	116.00	31.02

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
165.29	37.41	43.50	6.09	1000.00	120.00	100.0	V	36.00	20.65

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 23.6°C/51.5%/101kPa
Remark: 3m chamber



Critical Freqs

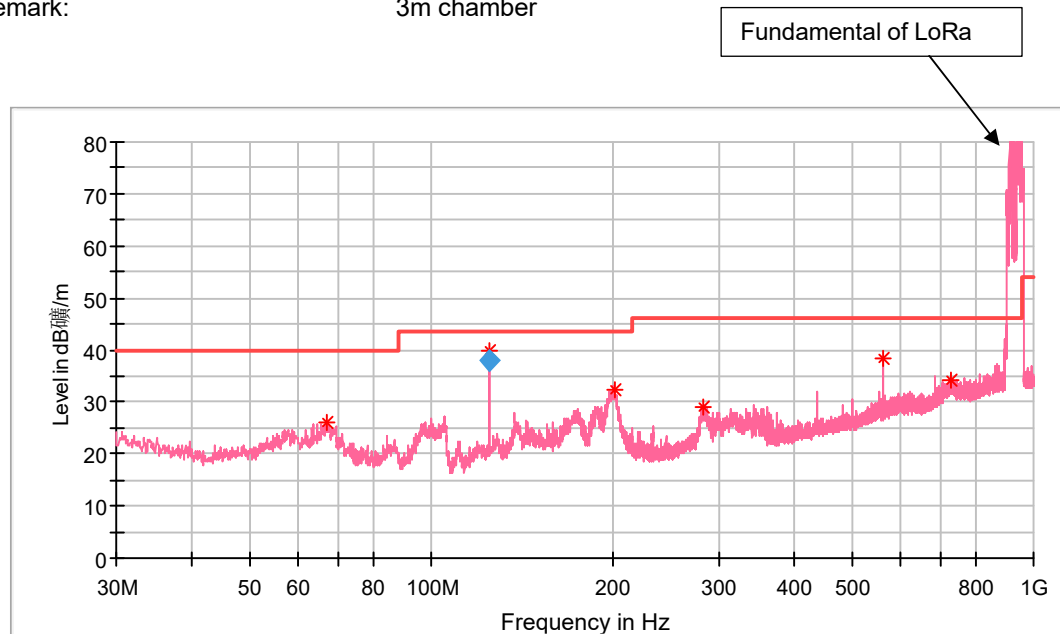
Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
87.01	24.76	40.00	15.24	200.0	H	206.00	15.10
124.99	37.56	43.50	5.94	200.0	H	302.00	18.79
201.31	33.05	43.50	10.45	200.0	H	49.00	17.43
359.96	37.23	46.00	8.77	100.0	H	221.00	22.85
562.48	36.62	46.00	9.38	200.0	H	121.00	27.51
687.50	36.75	46.00	9.25	100.0	H	221.00	30.10

Final Result

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
124.99	35.98	43.50	7.52	1000.00	120.00	200.0	H	302.00	18.80

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 23.6°C/51.5%/101kPa
Remark: 3m chamber



Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
66.97	26.14	40.00	13.86	100.0	V	56.00	18.98
124.99	39.82	43.50	3.68	100.0	V	50.00	18.79
201.37	32.50	43.50	11.00	100.0	V	68.00	17.43
282.36	29.01	46.00	16.99	100.0	V	50.00	21.03
562.48	38.34	46.00	7.66	100.0	V	0.00	27.51
729.26	34.27	46.00	11.73	100.0	V	206.00	31.06

Final Result

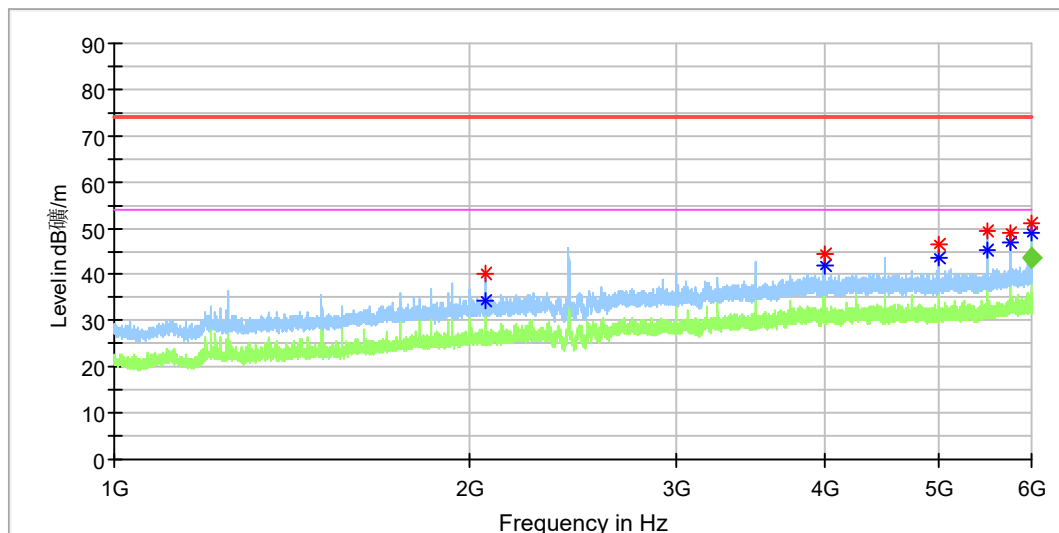
Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
124.99	38.03	43.50	5.47	1000.00	120.00	100.0	V	50.00	18.80

3 Appendix A.3: Test Plots of Radiated Emissions, above 1GHz

Note: Testing was carried out within frequency range 30MHz to the 5th harmonics. The measurement results above 6GHz were greater than 20dB below the limit, so only record the test result within the 30MHz to 6GHz.

EUT Information

EUT Name:	WisGate X Industrial
Order Number:	168500372(P01608439)
Model:	RAK7437
Test Mode:	On, normal operation powered by DC port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage:	AC 120V/60Hz
Test Standard:	FCC Part 15B
Test By:/Review By:	Dawn Shen/Murphy Chen
Tem./Hum./Pressure:	23.6°C/51.5%/101kPa
Remark:	3m chamber



Critical Freqs

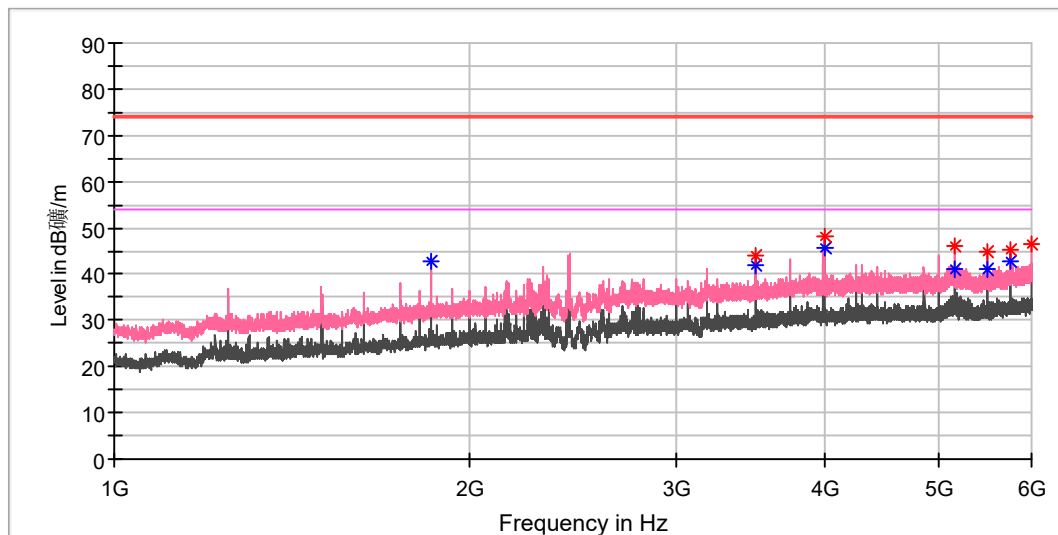
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
2062.50	---	34.25	54.00	19.75	100.0	H	127.00	-7.93
2062.50	40.22	---	74.00	33.78	100.0	H	127.00	-7.93
4000.00	---	41.93	54.00	12.07	100.0	H	189.00	-0.30
4000.00	44.22	---	74.00	29.78	100.0	H	189.00	-0.30
5000.00	---	43.43	54.00	10.57	100.0	H	231.00	1.68
5000.31	46.52	---	74.00	27.48	100.0	H	157.00	1.68
5500.00	---	45.27	54.00	8.73	100.0	H	334.00	2.45
5500.00	49.48	---	74.00	24.52	100.0	H	334.00	2.45
5750.00	---	46.81	54.00	7.19	100.0	H	213.00	3.37
5750.00	49.15	---	74.00	24.85	100.0	H	213.00	3.37
6000.00	50.98	---	74.00	23.02	100.0	H	194.00	3.91
6000.00	---	48.83	54.00	5.17	100.0	H	194.00	3.91

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6000.00	---	43.65	54.0	10.35	1000.00	1000.00	100.0	H	194.00	3.91

EUT Information

EUT Name:	WisGate X Industrial
Order Number:	168500372(P01608439)
Model:	RAK7437
Test Mode:	On, normal operation powered by DC port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage:	AC 120V/60Hz
Test Standard:	FCC Part 15B
Test By:/Review By:	Dawn Shen/Murphy Chen
Tem./Hum./Pressure:	23.6°C/51.5%/101kPa
Remark:	3m chamber



Critical_Freqs

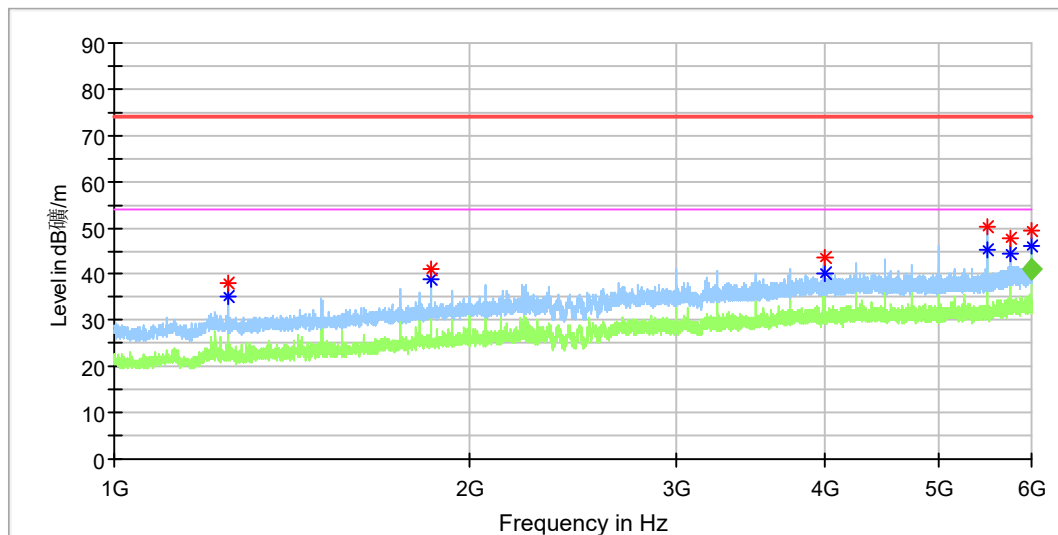
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1855.00	---	42.76	54.00	11.24	100.0	V	178.00	-8.81
3500.00	---	41.90	54.00	12.10	100.0	V	197.00	-2.37
3500.00	43.77	---	74.00	30.23	100.0	V	197.00	-2.37
4000.00	---	45.68	54.00	8.32	100.0	V	191.00	-0.30
4000.00	48.33	---	74.00	25.67	100.0	V	191.00	-0.30
5156.25	46.10	---	74.00	27.90	100.0	V	341.00	1.78
5156.56	---	40.98	54.00	13.02	100.0	V	0.00	1.78
5500.00	---	41.10	54.00	12.90	100.0	V	240.00	2.45
5500.00	44.78	---	74.00	29.22	100.0	V	240.00	2.45
5750.00	---	42.75	54.00	11.25	100.0	V	13.00	3.37
5750.00	45.23	---	74.00	28.77	100.0	V	13.00	3.37
6000.00	46.32	---	74.00	27.68	100.0	V	197.00	3.91

Final Result

Frequency (MHz)	MaxPeak (dBμV/ m)	Average (dBμV/ m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	P ol	Azimuth (deg)	Corr. (dB/m)
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EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By./Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 23.6°C/51.5%/101kPa
Remark: 3m chamber



Critical Freqs

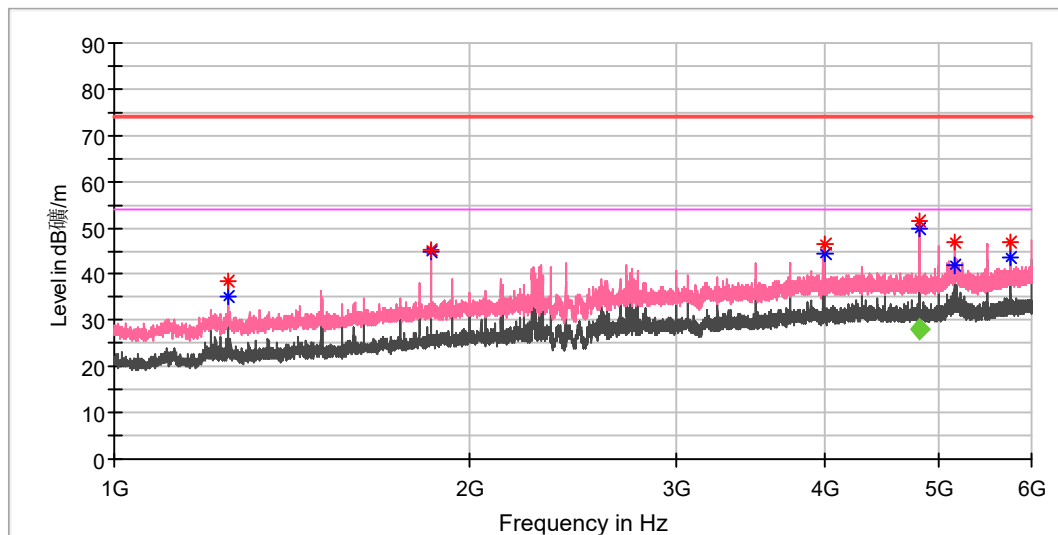
Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1249.69	38.07	---	74.00	35.93	100.0	H	216.00	-11.16
1250.00	---	35.13	54.00	18.87	100.0	H	5.00	-11.16
1855.00	---	39.01	54.00	14.99	100.0	H	246.00	-8.81
1855.00	40.82	---	74.00	33.18	100.0	H	246.00	-8.81
4000.00	---	40.08	54.00	13.92	100.0	H	252.00	-0.30
4000.31	43.50	---	74.00	30.50	100.0	H	246.00	-0.30
5500.31	---	45.36	54.00	8.64	100.0	H	319.00	2.45
5500.31	50.07	---	74.00	23.93	100.0	H	319.00	2.45
5749.69	---	44.28	54.00	9.72	100.0	H	240.00	3.37
5750.31	47.62	---	74.00	26.38	100.0	H	57.00	3.37
6000.00	49.55	---	74.00	24.45	100.0	H	204.00	3.91
6000.00	---	46.21	54.00	7.79	100.0	H	204.00	3.91

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
6000.00	---	41.14	54.0	12.86	1000.00	1000.00	100.0	H	204.00	3.91

EUT Information

EUT Name: WisGate X Industrial
Order Number: 168500372(P01608439)
Model: RAK7437
Test Mode: On, normal operation powered by PoE port, LoRa Link + 2.4G Wi-Fi Link + Data transmission with USB ports, ETH ports, SFP port
Test Voltage: AC 120V/60Hz
Test Standard: FCC Part 15B
Test By:/Review By: Dawn Shen/Murphy Chen
Tem./Hum./Pressure: 23.6°C/51.5%/101kPa
Remark: 3m chamber



Critical Freqs

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1250.00	---	34.98	54.00	19.02	100.0	V	173.00	-11.16
1250.00	38.51	---	74.00	35.49	100.0	V	173.00	-11.16
1855.00	45.25	---	74.00	28.75	100.0	V	178.00	-8.81
1855.00	---	44.69	54.00	9.31	100.0	V	178.00	-8.81
4000.00	---	44.18	54.00	9.82	100.0	V	191.00	-0.30
4000.00	46.63	---	74.00	27.37	100.0	V	191.00	-0.30
4824.06	---	49.94	54.00	4.06	100.0	V	0.00	1.00
4824.38	51.37	---	74.00	22.63	100.0	V	0.00	1.01
5156.56	---	41.70	54.00	12.30	100.0	V	0.00	1.78
5156.56	47.04	---	74.00	26.96	100.0	V	0.00	1.78
5750.00	---	43.74	54.00	10.26	100.0	V	309.00	3.37
5750.00	46.81	---	74.00	27.19	100.0	V	309.00	3.37

Final Result

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
4824.06	---	28.00	54.0	26.00	1000.00	1000.00	100.0	V	0.00	1.00