

<b>Prüfbericht-Nr.:</b> <i>Test report no.:</i>	<b>CN24VFE4 001</b>	<b>Auftrags-Nr.:</b> <i>Order no.:</i>	<b>168444032</b>	Seite 1 von 13 Page 1 of 13	
<b>Kunden-Referenz-Nr.:</b> <i>Client reference no.:</i>	<b>N/A</b>	<b>Auftragsdatum:</b> <i>Order date:</i>	<b>2023-09-26</b>		
<b>Auftraggeber:</b> <i>Client:</i>	<b>Shenzhen RAKwireless Technology Co.,Ltd.</b> Room 506, Building B, New Compark, Pingshan First Road, Taoyuan Street, Nanshan District, Shenzhen, Guangdong, P.R. China				
<b>Prüfgegenstand:</b> <i>Test item:</i>	<b>WisGate Edge Pro</b>				
<b>Bezeichnung / Typ-Nr.:</b> <i>Identification / Type no.:</i>	<b>RAK7229CV2</b> (Trademark: )				
<b>Auftrags-Inhalt:</b> <i>Order content:</i>	<b>Test Report</b>				
<b>Prüfgrundlage:</b> <i>Test specification:</i>	CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109 ICES-003 Issue 7 October 2020				
<b>Wareneingangsdatum:</b> <i>Date of sample receipt:</i>	<b>2023-09-26</b>	Refer to photos documents			
<b>Prüfmuster-Nr.:</b> <i>Test sample no.:</i>	<b>A003562972-001~002</b>				
<b>Prüfzeitraum:</b> <i>Testing period:</i>	<b>2023-09-26 - 2024-03-03</b>				
<b>Ort der Prüfung:</b> <i>Place of testing:</i>	<b>TÜV Rheinland (Shenzhen) Co., Ltd.</b>				
<b>Prüflaboratorium:</b> <i>Testing laboratory:</i>	<b>TÜV Rheinland (Shenzhen) Co., Ltd.</b>				
<b>Prüfergebnis*:</b> <i>Test result*:</i>	<b>Pass</b>				
<b>geprüft von:</b> <i>tested by:</i>	<b>X</b> <i>Hardy</i> <b>Hardy Suo</b>	<b>genehmigt von:</b> <i>authorized by:</i>	<b>X</b> <b>Lin Lin</b>		
<b>Datum:</b> <i>Date:</i>	<b>2024-03-12</b>	<b>Ausstellungsdatum:</b> <i>Issue date:</i>	<b>2024-03-12</b>		
<b>Stellung / Position</b>	<b>Sachverständige(r)/Expert</b>	<b>Stellung / Position</b>	<b>Sachverständige(r)/Expert</b>		
<b>Sonstiges /</b> <i>Other:</i>	<b>FCC ID: 2AF6B-RAK7229CV2</b>				
<b>Zustand des Prüfgegenstandes bei Anlieferung:</b> <i>Condition of the test item at delivery:</i>	<b>Prüfmuster vollständig und unbeschädigt</b> <i>Test item complete and undamaged</i>				
* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	3 = befriedigend N/A = nicht anwendbar	4 = ausreichend N/T = nicht	5 = mangelhaft N/T = nicht
* Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good F(ail) = failed a.m. test specification(s)	3 = satisfactory N/A = not applicable	4 = sufficient N/T = not tested	5 = poor 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>					

V05

Prüfbericht-Nr.: CN24VFE4 001  
Test report no.:

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**Anmerkungen**  
*Remarks*

<b>1</b>	<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. 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. Detailed information regarding test conditions, equipment and measurement uncertainty is available in the test laboratory and could be provided on request.</i></p>
<b>2</b>	<p>Wie vertraglich vereinbart, wurde dieses Dokument nur digital unterzeichnet. Der TÜV Rheinland hat nicht überprüft, welche rechtlichen oder sonstigen diesbezüglichen Anforderungen für dieses Dokument gelten. Diese Überprüfung liegt in der Verantwortung des Benutzers dieses Dokuments. Auf Verlangen des Kunden kann der TÜV Rheinland die Gültigkeit der digitalen Signatur durch ein gesondertes Dokument bestätigen. Diese Anfrage ist an unseren Vertrieb zu richten. Eine Umweltgebühr für einen solchen zusätzlichen Service wird erhoben.</p> <p><i>As contractually agreed, this document has been signed digitally only. TÜV Rheinland has not verified and unable to verify which legal or other pertaining requirements are applicable for this document. Such verification is within the responsibility of the user of this document. Upon request by its client, TÜV Rheinland can confirm the validity of the digital signature by a separate document. Such request shall be addressed to our Sales department. An environmental fee for such additional service will be charged.</i></p>
<b>3</b>	<p>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.</p> <p><i>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.</i></p>
<b>4</b>	<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>

## ***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.**

No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, People's Republic of China

FCC Registration No.: 694916

IC Registration No.: 25069, CAB identifier: CN0078

## 2.2 List of Test and Measurement Instruments

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

Terminal Disturbance Voltage at Mains Terminals					
Equip. No.	Equipment	Manufacturer	M/N	S/N	Calibrated until
GC-SZ 001009	EMI Test Receiver	R&S	ESR3	102428	2024-09-13
GC-SZ 001010	Artificial Mains Network	R&S	ENV216	102333	2024-07-31
GC-SZ 001011	Artificial Mains Network	R&S	ENV432	101411	2024-07-31
GC-SZ 001017	Impedance Stabilisation Network	R&S	ENY81	100323	2024-07-31
GC-SZ 001018	Impedance Stabilisation Network	R&S	ENY81-CA6	101810	2024-07-31
G1825090	EMC32 test software	R&S	EMC32 (Ver.10.50.00)	N/A	N/A
Radiated Emission (3m chamber)					
Equip. No.	Equipment	Manufacturer	M/N	S/N	Calibrated until
GC-SZ 001007	3m SAC	ETS-Lindgren	SAC3	CT001632- Q1362	2024-04-26
GC-SZ 004576	EMI Test Receiver	R&S	ESR7	102111	2024-11-09
GC-SZ 004488	Horn Antenna	R&S	HF907	102706	2024-08-03
GC-SZ 004484	Preamplifier (1-18GHz)	FIT	SCU-18F	180077	2024-07-31
GC-SZ 004489	Active magnetic loop antenna	SCHWARZBE CK	FMZB1519B	00080	2024-08-19
G1825090	EMC32 test software	R&S	EMC32 (Ver.10.60.20)	N/A	N/A

## 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

Test	Parameters	uncertainty
Conducted Emission	Conducted emission 150kHz-30MHz (AMN)	$\pm 3.70$ dB $\pm 3.30$ dB
Radiated Emission (3m SAC)	Radiated emission 30MHz-1GHz	$\pm 4.52$ dB
	Radiated emission 1GHz-18GHz	$\pm 4.37$ 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. Test facility located at No. 362 Huanguan Road Middle, Longhua District, Shenzhen 518110, 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 Edge Pro which supports Lora+GNSS, 2.4GHz Wi-Fi, BLE and WCDMA/LTE wireless technologies.

Contains FCC ID: XMR201807EG95NA, 2AF6B-RAK634, 2AF6B-RAK5148, 2AF6B-RAK5146, 2AF6B-RAK3400.

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 Edge Pro
Type Designation:	RAK7229CV2
Operating Voltage:	DC 12V via DC Source or DC 37 ~ 57V via POE adapter
Testing Voltage:	AC 230V, 50Hz or DC 12V
Operating Temperature Range:	-30 °C ~ +55 °C

### 3.3 Independent Operation Modes

The basic operation modes are:

- A. On, WIFI link + BLE link + WCDMA link + Lora link, powered by DC Source
- B. On, WIFI link + BLE link + LTE link + Lora link, powered by DC Source
- C. On, WIFI link + BLE link + WCDMA link + Lora link, powered by POE adapter
- D. On, WIFI link + BLE link + LTE link + Lora link, powered by POE adapter

### 3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

### 3.5 Submitted Documents

- Block Diagram
- Photo Document
- 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 RAK7229CV2

### 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
Power Supply	RISUNIC	RA040-0503000US	N/A	Input 100V~240V 0.6A, output 5V 3A

### 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)

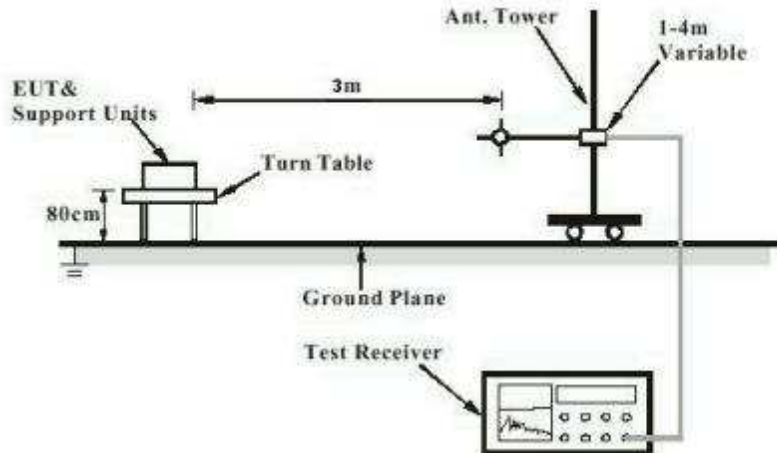


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

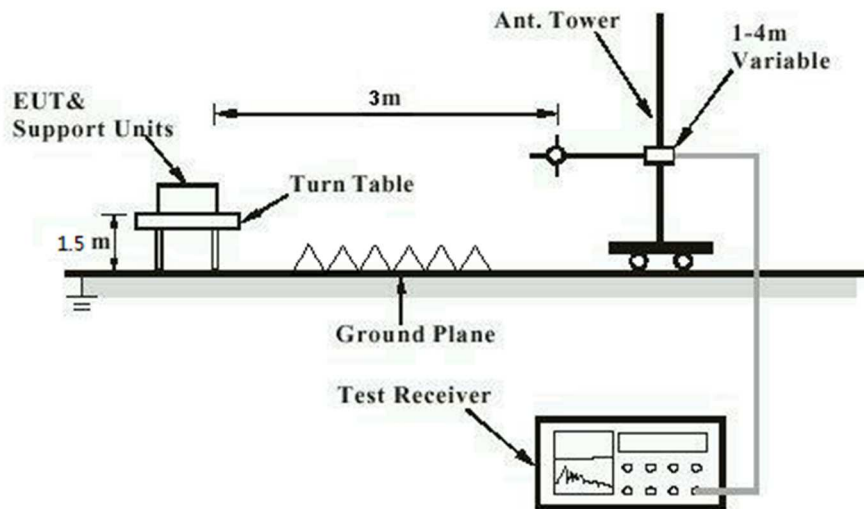
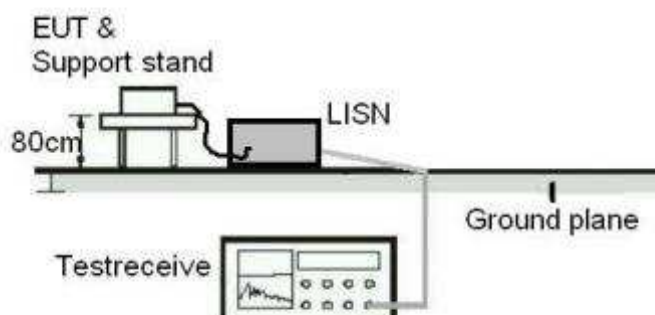


Diagram of Measurement Configuration for Mains Conduction Measurement



## 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	: 2023-09-26 - 2024-03-03
Input voltage	: AC 120V, 60Hz
Operation mode	: C, D
Earthing	: 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, only the worst case mode are shown in this report

## 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 <sup>th</sup> 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	: 2023-09-26 - 2024-03-03
Input voltage	: AC 120V, 60Hz or DC 12V
Operation mode	: A, B, C, D
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, only the worst case mode are shown in this report.

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.

Remark 2: The host (RAK7229CV2) has been evaluated according to module: WisLink LPWAN Concentrator with C2PC (FCC ID: 2AF6B-RAK5146) procedure in test report CN24MNS4 001, and the Radiated Spurious Emissions was carried out within frequency range 9 kHz to the fifth harmonics, refer to CN24MNS4 001 for details of measurement results.

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# **Appendix A**

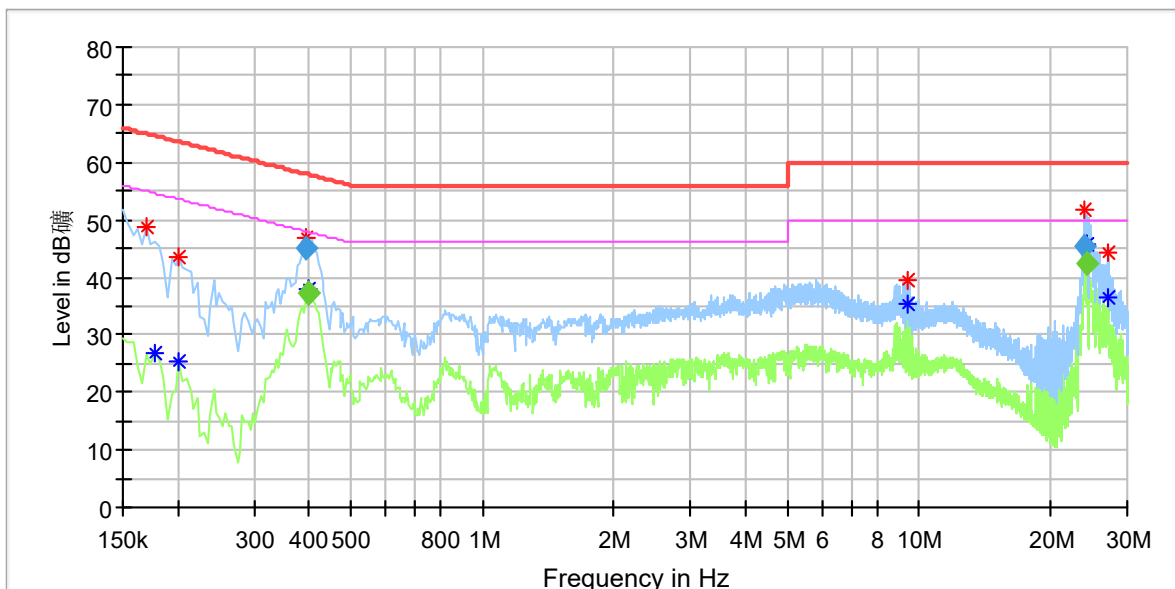
## **Test Results**

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## 1 Appendix A.1: Test Plots of Conducted Emissions

### EUT Information

EUT Name	WisGate Edge Pro
Order Number:	168444032(P01216680)
Model:	RAK7229CV2
Test Mode:	Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by POE adapter
Test Voltage:	AC 120V/60Hz
Test Standard:	FCC Part 15B
Test By./Review By:	Steven Lan/Gary Chen
Tem./Hum./Pressure:	21.3°C/50.8%/101kPa
Remark:	SR1



### Critical Freqs

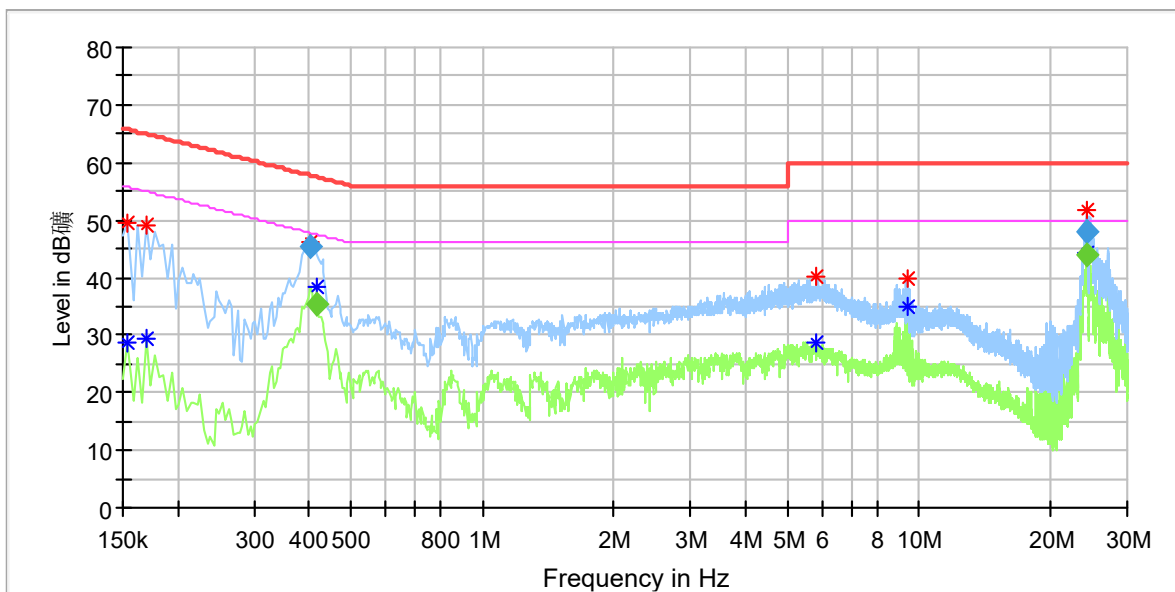
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.170000	48.63	---	64.96	16.33	L1	9.7
0.178000	---	26.71	54.58	27.87	L1	9.7
0.202000	---	25.42	53.53	28.10	L1	9.8
0.202000	43.47	---	63.53	20.06	L1	9.8
0.396500	46.93	---	57.73	10.80	L1	9.9
0.400500	---	37.82	47.73	9.91	L1	9.9
9.400000	39.50	---	60.00	20.50	L1	9.9
9.440000	---	35.46	50.00	14.54	L1	9.9
23.957500	51.79	---	60.00	8.21	L1	10.6
24.206500	---	45.67	50.00	4.33	L1	10.6
27.060000	44.34	---	60.00	15.66	L1	10.6
27.120000	---	36.43	50.00	13.57	L1	10.6

### Final Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.396500	45.09	---	57.93	12.84	1000.0	9.000	L1	9.9
0.400500	---	37.15	47.84	10.70	1000.0	9.000	L1	9.9
23.957500	45.50	---	60.00	14.50	1000.0	9.000	L1	10.6
24.206500	---	42.30	50.00	7.70	1000.0	9.000	L1	10.6

## EUT Information

EUT Name	WisGate Edge Pro
Order Number:	168444032(P01216680)
Model:	RAK7229CV2
Test Mode:	Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by POE adapter
Test Voltage:	AC 120V/60Hz
Test Standard:	FCC Part 15B
Test By./Review By:	Steven Lan/Gary Chen
Tem./Hum./Pressure:	21.3°C/50.8%/101kPa
Remark:	SR1



## Critical Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.154000	---	28.54	55.78	27.24	N	9.8
0.154000	49.62	---	65.78	16.16	N	9.8
0.170000	---	29.42	54.96	25.54	N	9.8
0.170000	49.20	---	64.96	15.76	N	9.8
0.404500	45.98	---	57.90	11.91	N	9.7
0.415500	---	38.15	47.81	9.66	N	9.7
5.784000	---	28.69	50.00	21.31	N	9.9
5.796000	40.10	---	60.00	19.90	N	9.9
9.400000	---	35.12	50.00	14.88	N	10.0
9.400000	39.89	---	60.00	20.11	N	10.0
24.150500	51.74	---	60.00	8.26	N	10.5
24.198500	---	44.45	50.00	5.55	N	10.5

## Final Result

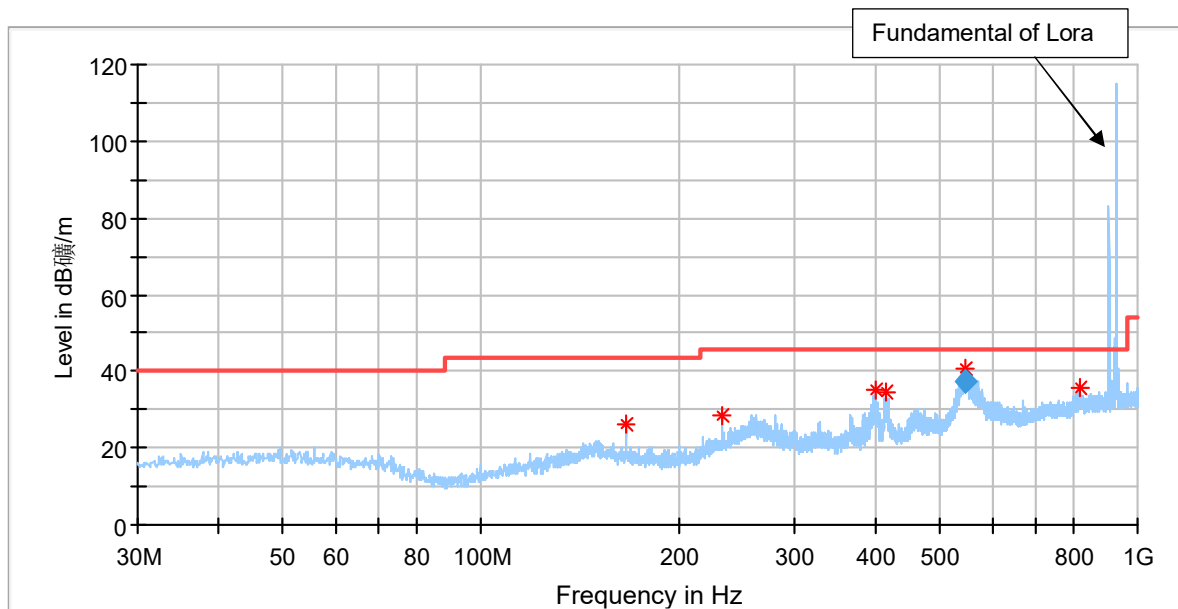
Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.404500	45.44	---	57.76	12.32	1000.0	9.000	N	9.7
0.415500	---	35.51	47.54	12.03	1000.0	9.000	N	9.7
24.150500	48.04	---	60.00	11.96	1000.0	9.000	N	10.5
24.198500	---	43.95	50.00	6.05	1000.0	9.000	N	10.5



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

### EUT Information

EUT Name:	WisGate Edge Pro
Order Number:	168444032(P01216680)
Model:	RAK7229CV2
Test Mode:	Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by DC Source
Test Voltage:	DC 12V
Test Standard:	FCC part 15B
Test By./Review By:	Steve Lan / Gary Chen
Tem./Hum./Pressure:	22.2°C/51.1%/101kPa
Remark:	3m chamber



### Critical Freqs

Frequency (MHz)	MaxiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
166.091000	26.38	43.50	17.12	200.0	H	58.0	20.7
232.439000	28.66	46.00	17.34	100.0	H	78.0	18.5
399.861000	35.14	46.00	10.86	100.0	H	127.0	24.1
412.665000	34.72	46.00	11.28	100.0	H	127.0	24.4
547.450000	40.89	46.00	5.11	200.0	H	43.0	27.6
814.730000	35.79	46.00	10.21	100.0	H	60.0	32.5

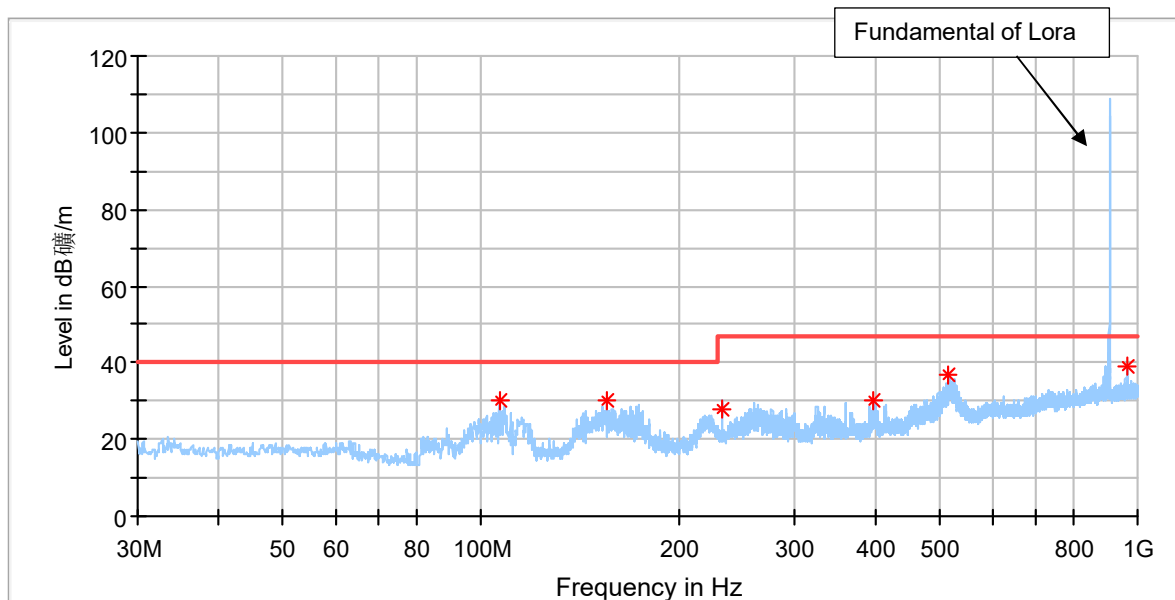
### Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
547.450000	37.58	46.00	8.42	1000.0	120.000	200.0	H	43.0	27.6



## EUT Information

EUT Name: WisGate Edge Pro  
 Order Number: 168444032(P01216680)  
 Model: RAK7229CV2  
 Test Mode: Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by POE adapter  
 Test Voltage: AC 120V/60Hz  
 Test Standard: FCC part 15B  
 Test By./Review By: Steve Lan / Gary Chen  
 Tem./Hum./Pressure: 22.2°C/51.1%/101kPa  
 Remark: 3m chamber

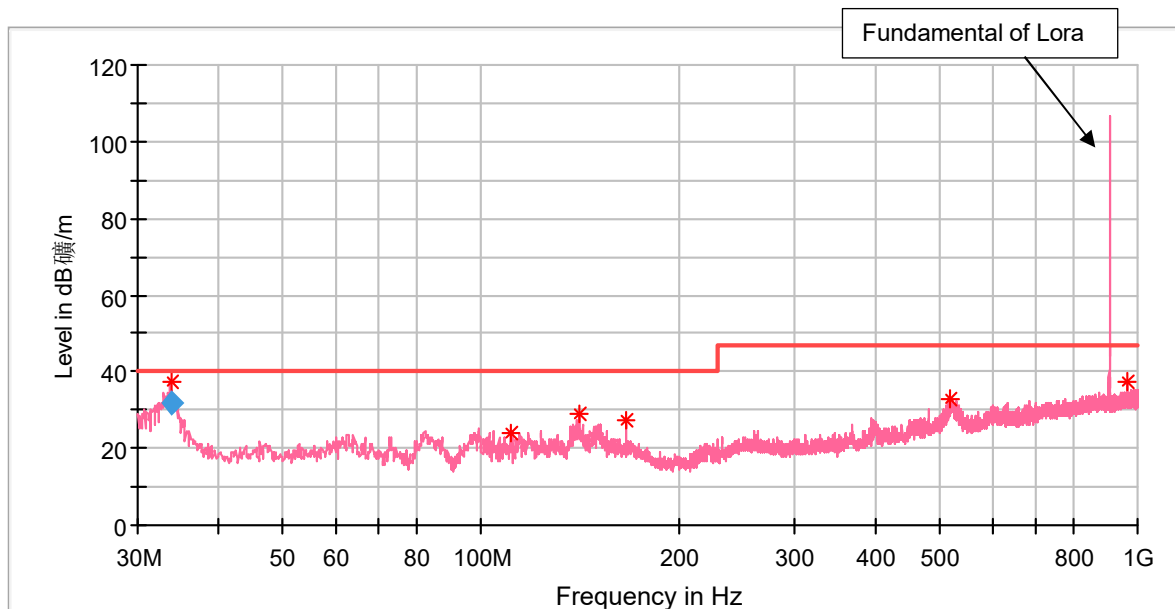


## Critical\_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
106.727000	30.06	40.00	9.94	200.0	H	270.0	17.1
155.518000	30.18	40.00	9.82	200.0	H	82.0	20.9
232.439000	28.14	47.00	18.86	100.0	H	76.0	18.5
397.145000	29.91	47.00	17.09	100.0	H	300.0	24.1
513.545000	36.68	47.00	10.32	100.0	H	260.0	26.9
960.036000	39.04	47.00	7.96	100.0	H	14.0	34.2

## EUT Information

EUT Name:	WisGate Edge Pro
Order Number:	168444032(P01216680)
Model:	RAK7229CV2
Test Mode:	Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by POE adapter
Test Voltage:	AC 120V/60Hz
Test Standard:	FCC part 15B
Test By./Review By:	Steve Lan / Gary Chen
Tem./Hum./Pressure:	22.2°C/51.1%/101kPa
Remark:	3m chamber



## Critical Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.909000	37.29	40.00	2.71	100.0	V	5.0	19.3
110.704000	23.82	40.00	16.18	100.0	V	101.0	17.5
141.162000	28.91	40.00	11.09	100.0	V	188.0	20.4
166.285000	27.31	40.00	12.69	100.0	V	354.0	20.6
519.850000	33.01	47.00	13.99	100.0	V	271.0	27.2
960.036000	37.62	47.00	9.38	200.0	V	350.0	34.2

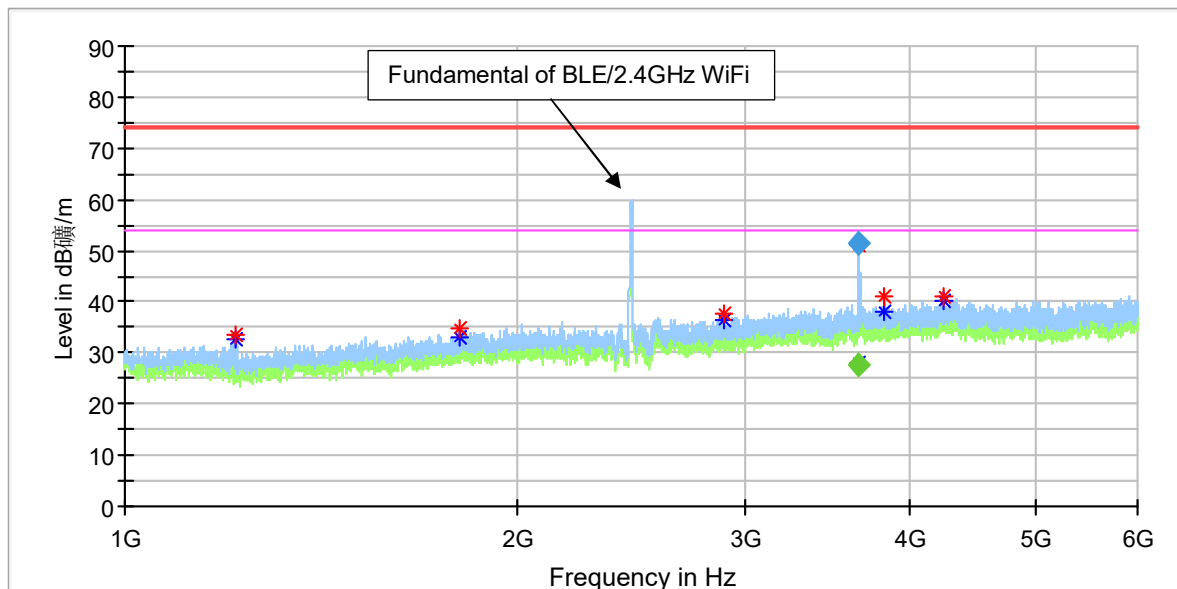
## Final Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.909000	32.03	40.00	7.97	1000.0	120.000	100.0	V	5.0	19.4

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

#### EUT Information

EUT Name:	WisGate Edge Pro
Order Number:	168444032(P01216680)
Model:	RAK7229CV2
Test Mode:	Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by DC Source
Test Voltage:	DC 12V
Test Standard:	FCC part 15B
Test By:/Review By:	Steve Lan / Gary Chen
Tem./Hum./Pressure:	22.2°C/51.1%/101kPa
Remark:	3m chamber



#### Critical Freqs

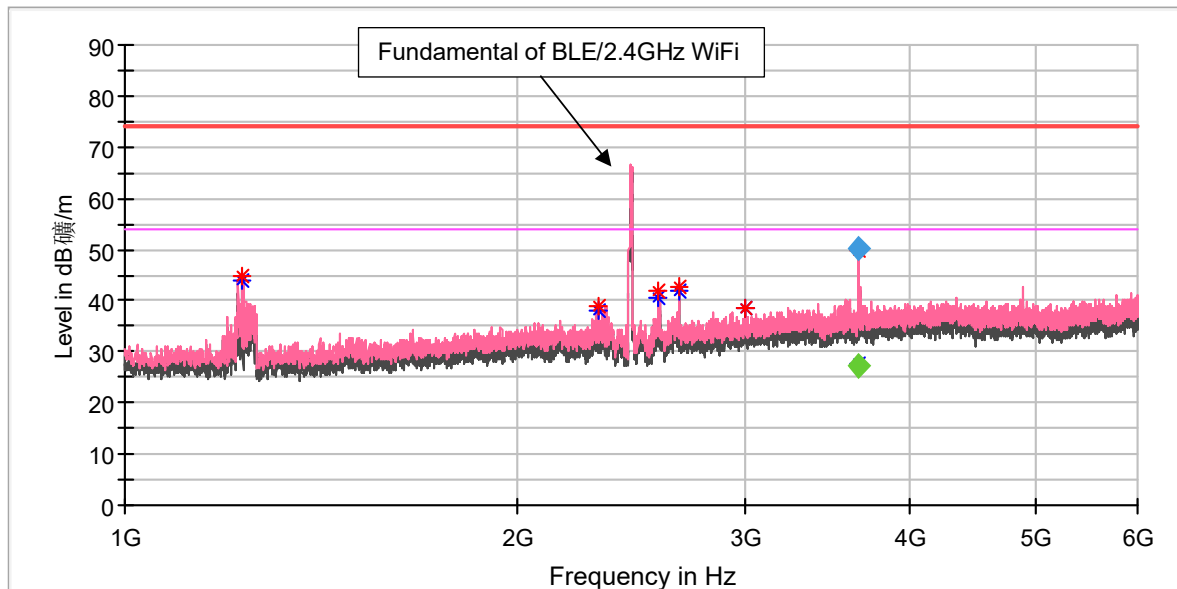
Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
1219.000000	---	32.82	54.00	21.18	100.0	H	169.0	-11.0
1219.000000	33.58	---	74.00	40.42	100.0	H	169.0	-11.0
1811.000000	---	33.11	54.00	20.89	100.0	H	334.0	-7.8
1811.000000	34.84	---	74.00	39.16	100.0	H	334.0	-7.8
2885.500000	---	36.32	54.00	17.68	100.0	H	50.0	-4.2
2885.500000	37.49	---	74.00	36.51	100.0	H	50.0	-4.2
3664.300000	51.25	---	74.00	22.75	100.0	H	105.0	-1.2
3665.100000	---	27.88	54.00	26.12	100.0	H	105.0	-1.2
3836.500000	40.83	---	74.00	33.17	100.0	H	302.0	-0.6
3837.000000	---	38.03	54.00	15.97	100.0	H	302.0	-0.6
4259.000000	---	40.20	54.00	13.80	100.0	H	313.0	1.1
4259.000000	40.82	---	74.00	33.18	100.0	H	313.0	1.1

#### 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)
3664.300000	51.64	---	74.00	22.36	1000.0	1000.00	100.0	H	105.0	-1.2
3665.100000	---	27.44	54.00	26.56	1000.0	1000.00	100.0	H	105.0	-1.2

## EUT Information

EUT Name: WisGate Edge Pro  
 Order Number: 168444032(P01216680)  
 Model: RAK7229CV2  
 Test Mode: Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by DC Source  
 Test Voltage: DC 12V  
 Test Standard: FCC part 15B  
 Test By./Review By: Steve Lan / Gary Chen  
 Tem./Hum./Pressure: 22.2°C/51.1%/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)
1230.000000	---	44.08	54.00	9.92	100.0	V	198.0	-11.0
1230.000000	44.70	---	74.00	29.30	100.0	V	198.0	-11.0
2311.500000	---	37.95	54.00	16.05	100.0	V	144.0	-6.4
2311.500000	39.05	---	74.00	34.95	100.0	V	144.0	-6.4
2572.000000	---	40.52	54.00	13.48	100.0	V	0.0	-4.8
2572.000000	42.04	---	74.00	31.96	100.0	V	0.0	-4.8
2662.500000	42.51	---	74.00	31.49	100.0	V	137.0	-4.8
2662.500000	---	41.85	54.00	12.15	100.0	V	137.0	-4.8
2999.500000	---	38.36	54.00	15.64	100.0	V	13.0	-3.1
2999.500000	38.68	---	74.00	35.32	100.0	V	13.0	-3.1
3664.300000	---	27.81	54.00	26.19	100.0	V	13.0	-1.2
3665.100000	49.82	---	74.00	24.18	100.0	V	13.0	-1.2

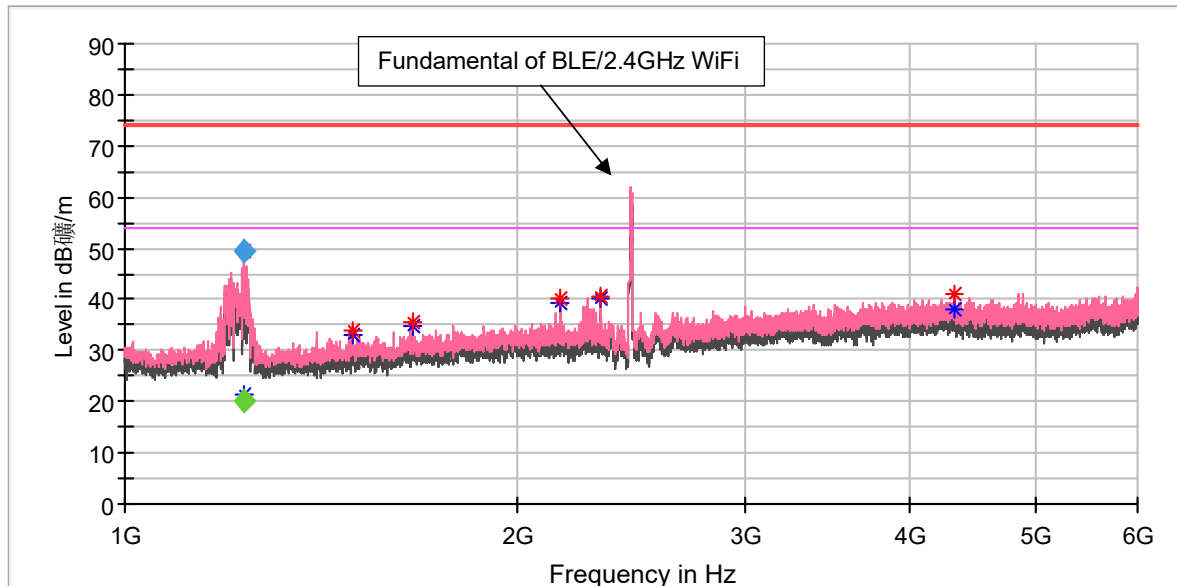
## Final Result

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)
3664.300000	---	27.35	54.00	26.65	1000.0	1000.00	100.0	V	13.0	-1.2
3665.100000	50.30	---	74.00	23.70	1000.0	1000.00	100.0	V	13.0	-1.2



## EUT Information

EUT Name: WisGate Edge Pro  
 Order Number: 168444032(P01216680)  
 Model: RAK7229CV2  
 Test Mode: Normal Operation by WIFI link + BLE link + LTE link + Lora link, powered by POE adapter  
 Test Voltage: AC 120V/60Hz  
 Test Standard: FCC part 15B  
 Test By./Review By: Steve Lan / Gary Chen  
 Tem./Hum./Pressure: 22.2°C/51.1%/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)
1235.200000	---	21.25	54.00	32.75	100.0	V	154.0	-11.0
1235.600000	49.24	---	74.00	24.76	100.0	V	154.0	-11.0
1497.000000	---	33.10	54.00	20.90	100.0	V	342.0	-9.0
1497.000000	33.89	---	74.00	40.11	100.0	V	342.0	-9.0
1661.500000	---	34.65	54.00	19.35	100.0	V	352.0	-8.6
1661.500000	35.41	---	74.00	38.59	100.0	V	352.0	-8.6
2162.000000	---	39.26	54.00	14.74	100.0	V	79.0	-6.9
2162.000000	40.07	---	74.00	33.93	100.0	V	79.0	-6.9
2322.000000	40.74	---	74.00	33.26	100.0	V	30.0	-6.4
2322.500000	---	40.08	54.00	13.92	100.0	V	30.0	-6.4
4335.500000	---	37.95	54.00	16.05	100.0	V	0.0	1.1
4335.500000	40.97	---	74.00	33.03	100.0	V	0.0	1.1

## 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)
1235.200000	---	20.15	54.00	33.85	1000.0	1000.00	100.0	V	154.0	-11.0
1235.600000	49.44	---	74.00	24.56	1000.0	1000.00	100.0	V	154.0	-11.0