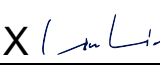


Prüfbericht-Nr.: <i>Test report no.:</i>	CN22LJYU 004	Auftrags-Nr.: <i>Order no.:</i>	168490719	Seite 1 von 31 <i>Page 1 of 31</i>
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2024-06-24	
Auftraggeber: <i>Client:</i>	Shenzhen RAKwireless Technology Co.,Ltd. Room 506, Building B, New Compark, Pingshan First Road, Taoyuan Street, Nanshan District, Shenzhen, Guangdong, P.R. China			
Prüfgegenstand: <i>Test item:</i>	WisGate			
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	RAK7268C, RAK7268CV2 (Trademark: )			
Auftrags-Inhalt: <i>Order content:</i>	CIIPC and C4PC			
Prüfgrundlage: <i>Test specification:</i>	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 22 CFR47 FCC Part 24 CFR47 FCC Part 27		RSS-247 Issue 3 RSS-130 Issue 2 RSS-132 Issue 3 RSS-133 Issue 6 RSS-139 Issue 3	
Wareneingangsdatum: <i>Date of sample receipt:</i>	2024-07-01	Refer to photos documents		
Prüfmuster-Nr.: <i>Test sample no:</i>	A003755951-001			
Prüfzeitraum: <i>Testing period:</i>	2024-07-01 - 2024-08-15			
Ort der Prüfung: <i>Place of testing:</i>	Refer to section 2.1			
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>	2024-08-20		Ausstellungsdatum: <i>Issue date:</i>	2024-08-20
Stellung / Position	Sachverständige(r)/Expert		Stellung / Position	Sachverständige(r)/Expert
Sonstiges / Other:	FCC ID: 2AF6B-RAK2287X, IC ID: 25908-RAK2287X HMN: RAK7268C, RAK7268CV2 *The LTE module, Wi-Fi module and Lora module are combination in a new host, the co-located radiated spurious emission is arrange re-assessment. ** This product contains transmitter modules, refer to clause 3.2 for details. This report based on previous report CN22LJYU 002 (issued by TÜV Rheinland (Shenzhen) Co., Ltd.) for adding an alternative Lora Module (MN: RAK2287X), refer to section 3.1 for details.			
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	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>
2	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. <i>As contractually agreed, this document has been signed digitally only. TUV 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, TUV 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>
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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Modification record	
CN22LJYU 002	First release
CN22LJYU 004	Adds an alternative Lora Module (MN: RAK2287X)

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Test Summary

5.1 Co-Located Radiated Spurious Emissions

RESULT: Pass

5.2 Conducted 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 Set-up 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

Shenzhen UnionTrust Quality and Technology Co., Ltd.

16/F, Block A, Building 6, Baoneng Science and Technology Park, Qingxiang Road No.1, Longhua New District, Shenzhen, China

A2LA Certificate Number: 4312.01

IC Registration No.: 21600, CAB identifier: CN0032

Remark: Conducted Emissions was performed at Shenzhen UnionTrust Quality and Technology Co., Ltd.

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment (TÜV Rheinland (Shenzhen) Co., Ltd.)

Unwanted Emission Testing (TS8996)						
Equip. No.	Description	Manufacturer	Model	Serial No.	Calibrated Date (DD.MM.YYYY)	Calibrated until (DD.MM.YYYY)
G1825844	Signal Generator	R&S	SMB100A	180840	26.07.2023	25.07.2024
G1825846	Signal Analyzer	R&S	FSV 40	101440	06.08.2023	05.08.2024
G1825847	System Controller Interface	R&S	SCI-100	S10010036	N/A	N/A
G1825850	OSP	R&S	OSP 120	102041	N/A	N/A
G1825851	OSP	R&S	OSP 150	101385	14.11.2023	13.11.2024
G1825852	Pre-amplifier	R&S	SCU08F1	08320030	26.07.2023	25.07.2024
G1825853	Amplifier	R&S	SCU-18F	180079	26.07.2023	25.07.2024
G1825854	Amplifier	R&S	SCU40A	100450	26.07.2023	25.07.2024
G1825855	Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	192	07.08.2022	06.08.2024
G1825856	Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218719	07.08.2022	06.08.2024
G1825857	Wideband Ridged Horn Antenna (12-18 GHz)	Steatite	QMS-00208	18312	07.08.2022	06.08.2024
G1825858	Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19066	28.08.2022	27.08.2024
G1825859	Biconical Broadband Antenna (30 MHz - 1 GHz)	Schwarzbeck	VUBA 9117	357	02.08.2021	02.08.2024
G1825860	Double Ridged Broadband Horn Antenna (1 – 18 GHz)	Schwarzbeck	BBHA 9120 D	01760	30.07.2021	30.07.2024
G1825861	Broadband Horn Antenna (15 – 40 GHz)	Schwarzbeck	BBHA 9170	00862	02.08.2021	02.08.2024
G1825862	Test software	R&S	EMC32 (V10.50.40)	N/A	N/A	N/A
G1825863	Control PC	Dell	OptiPlex 7050	36NW9P2	N/A	N/A
G1826433	3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC1715 1-SAC	21.06.2024	20.06.2025

Table 2: List of Test and Measurement Equipment (Shenzhen UnionTrust Quality and Technology Co., Ltd.)

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Conducted Emission				
LISN	R&S	ESH2-Z5	860014/024	26-Oct-2024
Receiver	R&S	ESR7	101181	26-Oct-2024
Pulse Limiter	R&S	ESH3-Z2	0357.8810.54	26-Oct-2024
Shielding room	ETS-Lindgren	843	Euroshiedpn-CT001270-1246	4-Nov-2024
Test Software	EZ-EMC	EZ-CON	Software Version: EMC-CON 3A1.1	

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)	± 3.70 dB
		± 3.30 dB
Radiated Emission	Radiated emission 30MHz-1GHz	± 4.52 dB
	Radiated emission 1GHz-18GHz	± 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 which supports Lora, 2.4GHz Wi-Fi and LTE wireless technologies.

Contains FCC ID: XMR201807EG95NA, 2AF6B-RAK634, 2AF6B-RAK2287X.

Contains IC: 10224A-2018EG95NA, 25908-RAK634, 25908-RAK2287X.

The model RAK7268C is identical with model RAK7268CV2 except non-radio related Flash chip U2 (on the wifi module): 16MB and 32MB, and this two Flash chip are pin to pin only the storage space is different.

This report based on previous CN22LJYU 002 (issued by TÜV Rheinland (Shenzhen) Co., Ltd.) for adding an alternative Lora module (MN: RAK2287X), additional EMC tests were re-performed on model RAK7268CV2 with new Lora module (MN: RAK2287X). Refer to report previous CN22LJYU 002 for original test data with Lora module (MN: RAK5146).

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

3.2 Ratings and System Details

Table 3: Technical Specification of EUT

General Information of EUT	Description
Kind of Equipment:	WisGate
Type Designation:	RAK7268C, RAK7268CV2
HMN:	RAK7268C, RAK7268CV2
Operating Voltage:	DC 12V via AC/DC Adapter or DC 37 ~ 57V via POE adapter
Testing Voltage:	AC 120V, 60Hz (Power supply to AC/DC Adapter or POE adapter)
Operating Temperature Range:	-30 °C ~ +45 °C
Remark: This product assembles multi-transmitter modules: - LTE Module (FCC ID: XMR201807EG95NA, IC ID: 10224A-2018EG95NA) - Wi-Fi Module (FCC ID: 2AF6B-RAK634, IC ID: 25908-RAK634) - LoRa Concentrator Module (FCC ID: 2AF6B-RAK2287X, IC ID: 25908-RAK2287X)	
Technical Specification of 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
Antenna Gain:	Main ANT (698-894MHz, 1710-2690MHz): 2.9dBi@780MHz,

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	3.5dBi@2300MHz (declared by client)
	Diversity ANT (1710-2690MHz): 4.4dBi @2650MHz (declared by client)
Model of contained LTE module:	EG95-NA
FCC ID	XMR201807EG95NA
IC ID	10224A-2018EG95NA
Technical Specification of Wi-Fi Module	
Characteristic	Description
Operating Frequency	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)
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 ~ MCS7 for 802.11n
Channel Number:	11 channels for 802.11b/g/n(HT20) 7 channels for 802.11n(HT40)
Antenna Number:	2412 - 2462 MHz for 802.11b/g/n(HT20) 2422 - 2452 MHz for 802.11n(HT40)
Antenna Gain:	3.0dBi for Ant0 (declared by client) 3.0dBi for Ant1 (declared by client)
Model of contained Wi-Fi Module:	RAK634
FCC ID	2AF6B-RAK634
IC ID	25908-RAK634
Technical Specification of LoRa Concentrator Module	
Characteristic	Description
Operating Frequency	904.6MHz, 923.3 - 927.5MHz for DTS LoRa 903.9MHz - 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:	2.3dBi (declared by client)
Model of contained Lora Module:	RAK2287X
FCC ID	2AF6B-RAK2287X
IC ID	25908-RAK2287X

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, 2.4G WIFI + WCDMA + LoRa
- B. On, 2.4G WIFI + LTE + LoRa

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

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

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 tests were performed according to the procedures in ANSI C63.10.

Note: The test standard for frequency Bands 698-756 MHz and 777-787 MHz in LTE module test report is RSS-130 issue 1 and the essential requirements remain unchanged in the updated version RSS-130 issue 2, hence it has been updated in current test report without additional test.

4.3 Special Accessories and Auxiliary Equipment

Table 4: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model No.	Serial Number or Rating
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	166305
Portable Laptop	Lenovo	ThinkPad T480	10Q67059
POE Adapter	RAK	GRT-POE20-480050	Input: AC 100V~240V, 50/60Hz, 0.5A Max Output: DC 48V, 0.5A, 24W

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)

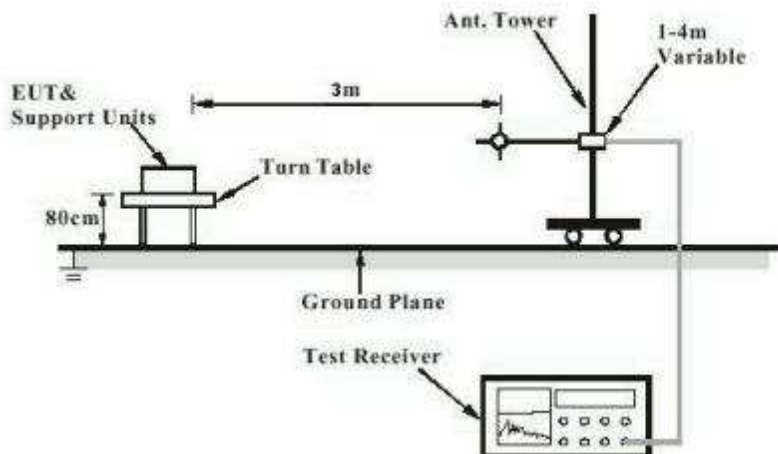


Diagram of Measurement Configuration for Radiation Test (Above 1GHz)

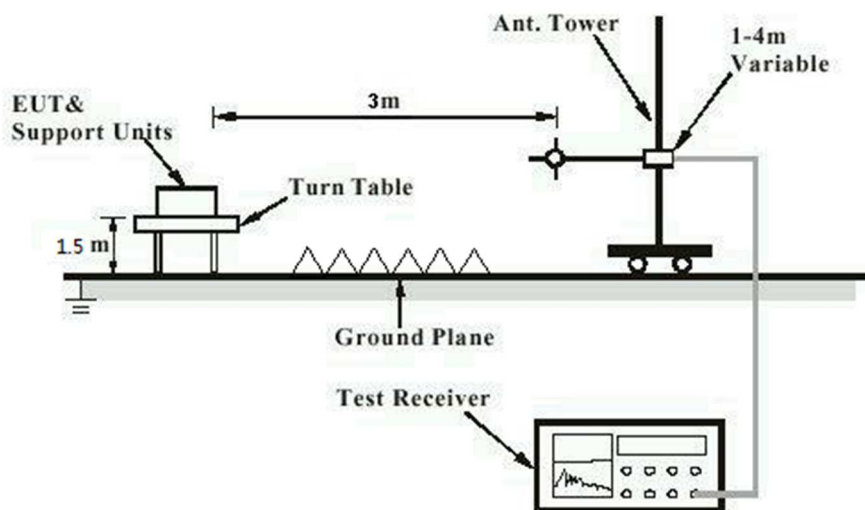
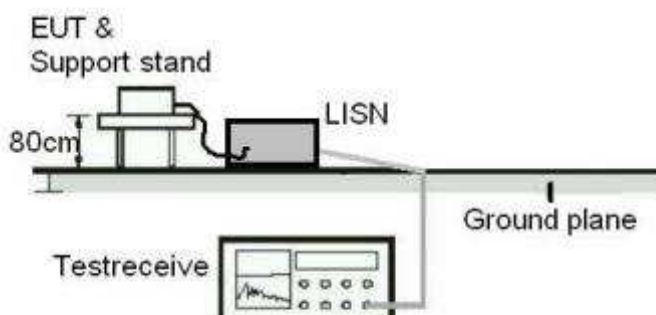


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1 Co-Located Radiated Spurious Emissions

RESULT: Pass

Test Specification

Test standard	:	CFR47 FCC Part 15: Subpart C Section 15.247
		CFR47 FCC Part 22
		CFR47 FCC Part 24
		CFR47 FCC Part 27
		RSS-247 Issue 3
		RSS-130 Issue 2
		RSS-132 Issue 3
Basic standard	:	RSS-133 Issue 6
		RSS-139 Issue 3
		ANSI C63.10 & ANSI C63.26
		KDB 996369 D04
Limit	:	The emissions not exceed the highest limit.
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

Date of testing	:	2024-07-01 - 2024-07-17
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

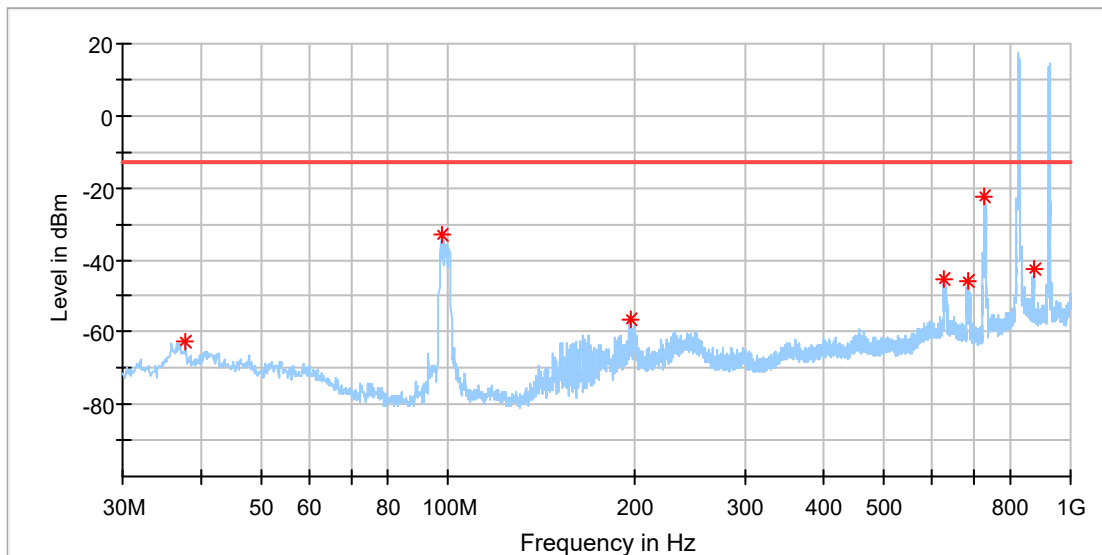
Note: The test plots of Co-located radiated spurious emissions beyond the limit are the fundamental radio frequency of Lora, Wi-Fi and LTE.
 For the measurement records, refer to the following plots, only the worst case mode are shown in this report.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+WCDMA Band V
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 22
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

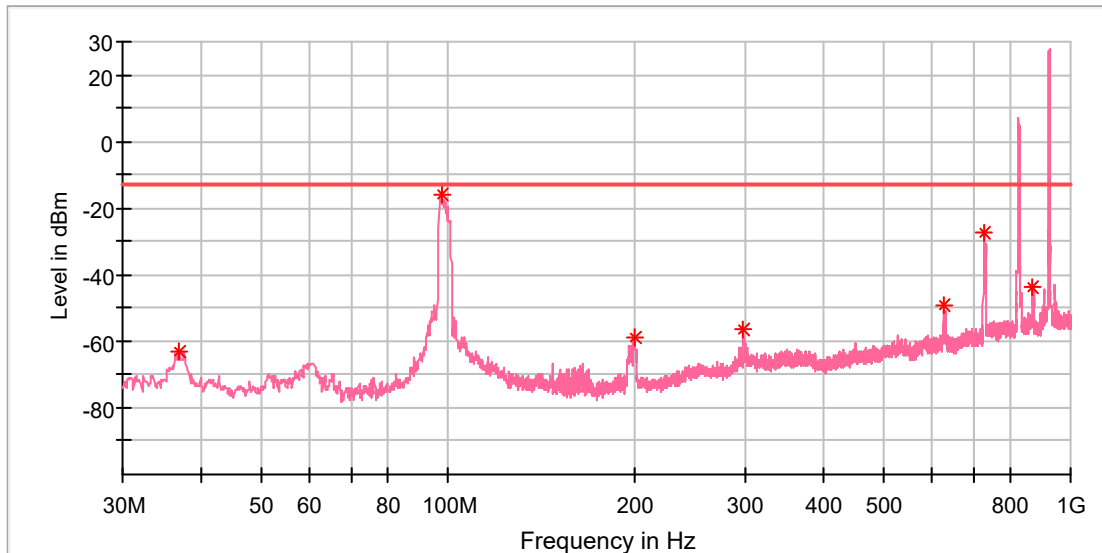
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
37.760000	-62.38	-13.00	49.38	100.0	H	0.0	-113.9
97.415000	-33.11	-13.00	20.11	100.0	H	177.0	-122.5
195.991250	-56.33	-13.00	43.33	100.0	H	177.0	-115.1
626.550000	-45.49	-13.00	32.49	100.0	H	177.0	-105.3
684.386250	-45.61	-13.00	32.61	100.0	H	286.0	-106.1
725.368750	-22.61	-13.00	9.61	100.0	H	177.0	-107.2
872.445000	-42.63	-13.00	29.63	100.0	H	198.0	-101.8

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+WCDMA Band V
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 22
Tested By:	Kei Zhang
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Critical_Freqs

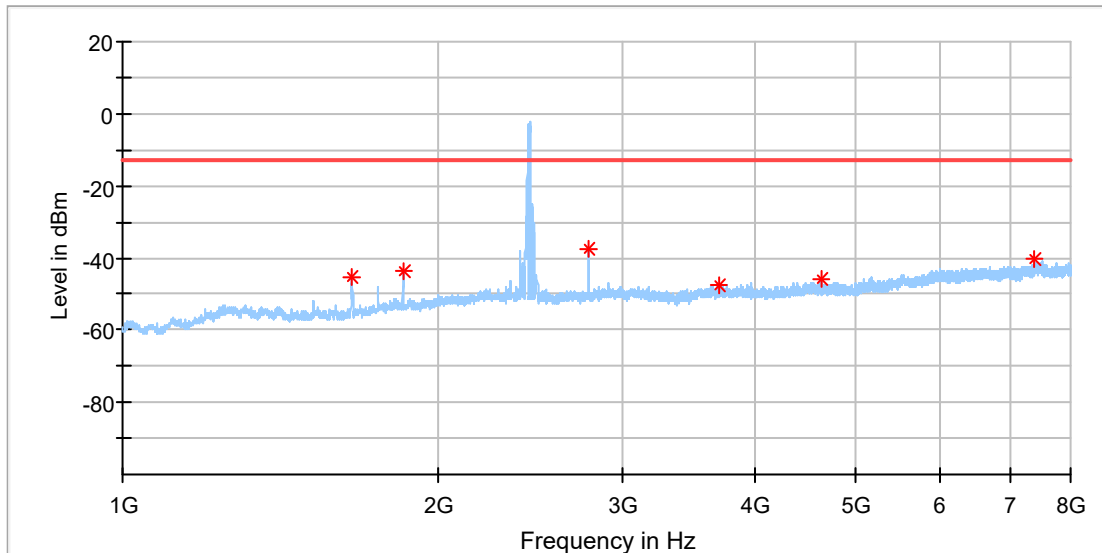
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
37.032500	-63.14	-13.00	50.14	100.0	V	53.0	-125.5
97.778750	-16.07	-13.00	3.07	100.0	V	34.0	-103.0
198.780000	-58.93	-13.00	45.93	100.0	V	266.0	-117.9
298.932500	-56.17	-13.00	43.17	100.0	V	34.0	-111.3
626.428750	-49.22	-13.00	36.22	100.0	V	34.0	-106.6
726.823750	-27.30	-13.00	14.30	100.0	V	40.0	-103.8
870.626250	-43.80	-13.00	30.80	100.0	V	24.0	-101.3

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
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Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 22
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

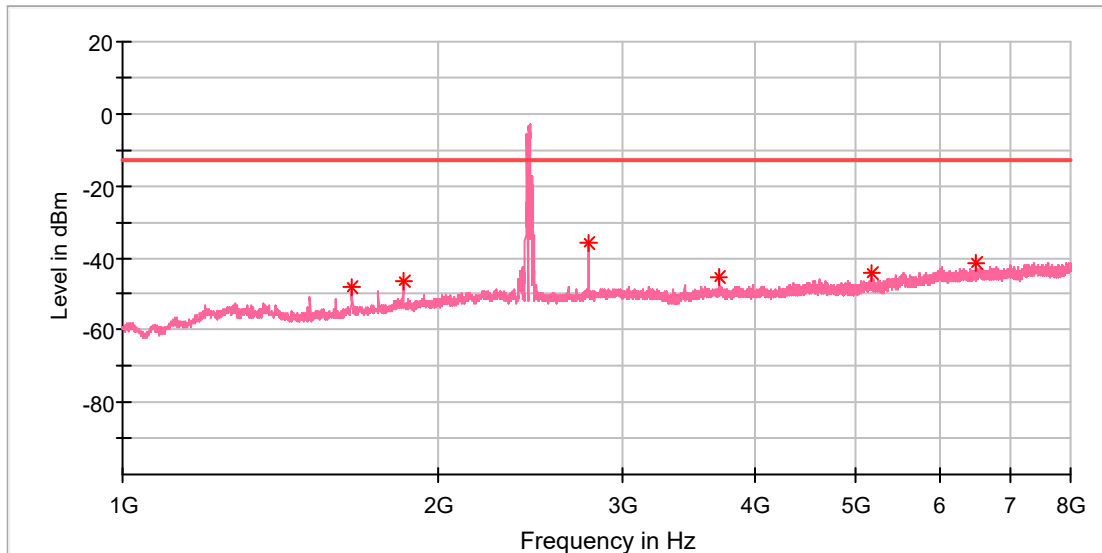
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1655.000000	-45.55	-13.00	32.55	150.0	H	7.0	-92.6
1850.000000	-43.38	-13.00	30.38	150.0	H	132.0	-90.5
2775.500000	-37.64	-13.00	24.64	150.0	H	13.0	-87.6
3700.000000	-47.37	-13.00	34.37	150.0	H	277.0	-86.7
4626.500000	-45.77	-13.00	32.77	150.0	H	4.0	-85.7
7402.500000	-40.17	-13.00	27.17	150.0	H	357.0	-79.7

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+WCDMA Band V
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 22
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

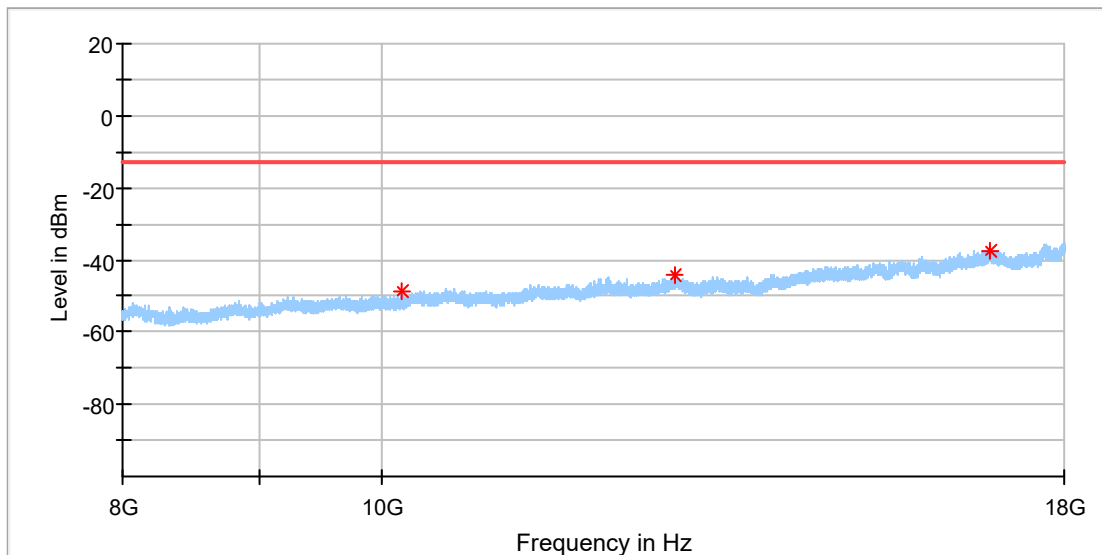
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1650.500000	-48.23	-13.00	35.23	150.0	V	207.0	-92.4
1851.000000	-46.37	-13.00	33.37	150.0	V	48.0	-90.2
2775.000000	-35.80	-13.00	22.80	150.0	V	92.0	-87.3
3700.500000	-45.14	-13.00	32.14	150.0	V	319.0	-86.7
5177.000000	-44.30	-13.00	31.30	150.0	V	205.0	-84.7
6510.500000	-41.34	-13.00	28.34	150.0	V	61.0	-81.2

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+WCDMA Band V
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 22
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

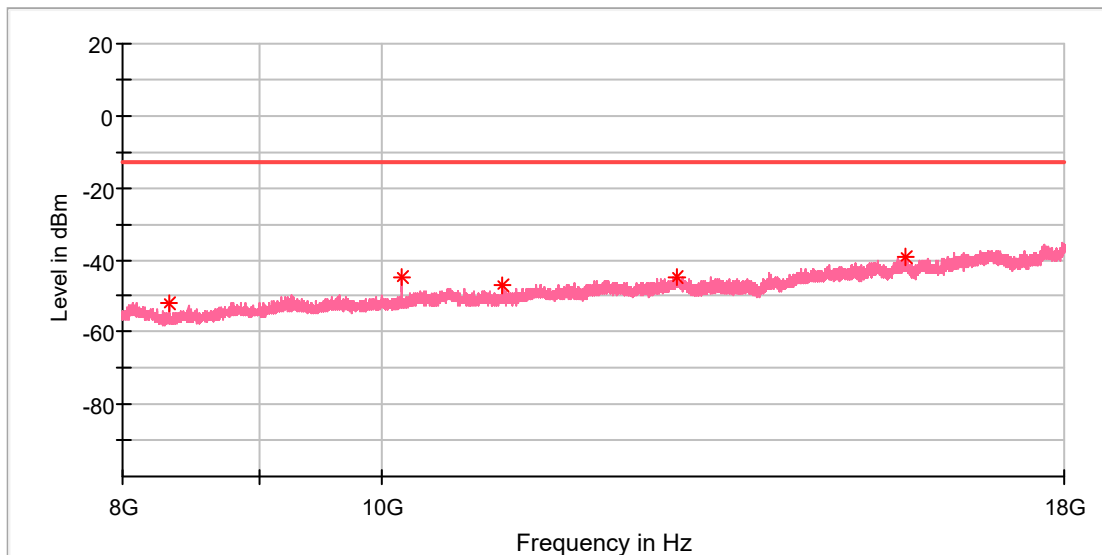
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
10179.000000	-48.78	-13.00	35.78	150.0	H	24.0	-83.3
12869.500000	-44.38	-13.00	31.38	150.0	H	95.0	-78.8
16874.000000	-37.36	-13.00	24.36	150.0	H	119.0	-73.1

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+WCDMA Band V
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 22
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

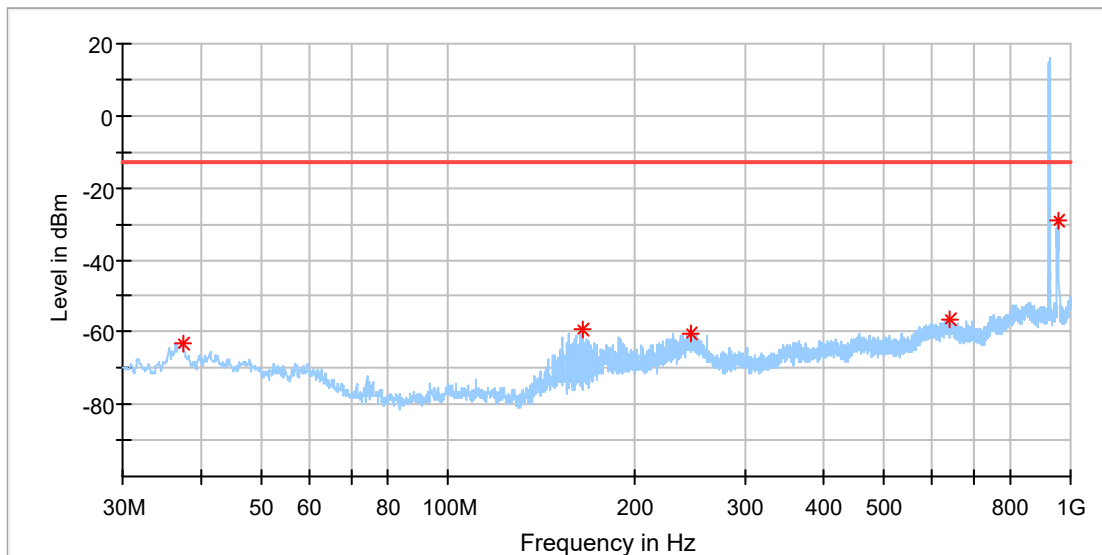
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
8324.000000	-52.14	-13.00	39.14	150.0	V	266.0	-87.5
10175.000000	-44.73	-13.00	31.73	150.0	V	349.0	-83.5
11101.500000	-46.83	-13.00	33.83	150.0	V	349.0	-82.8
12894.000000	-44.73	-13.00	31.73	150.0	V	301.0	-78.5
15707.000000	-38.89	-13.00	25.89	150.0	V	285.0	-77.4

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+LTE Band 2
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 24
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

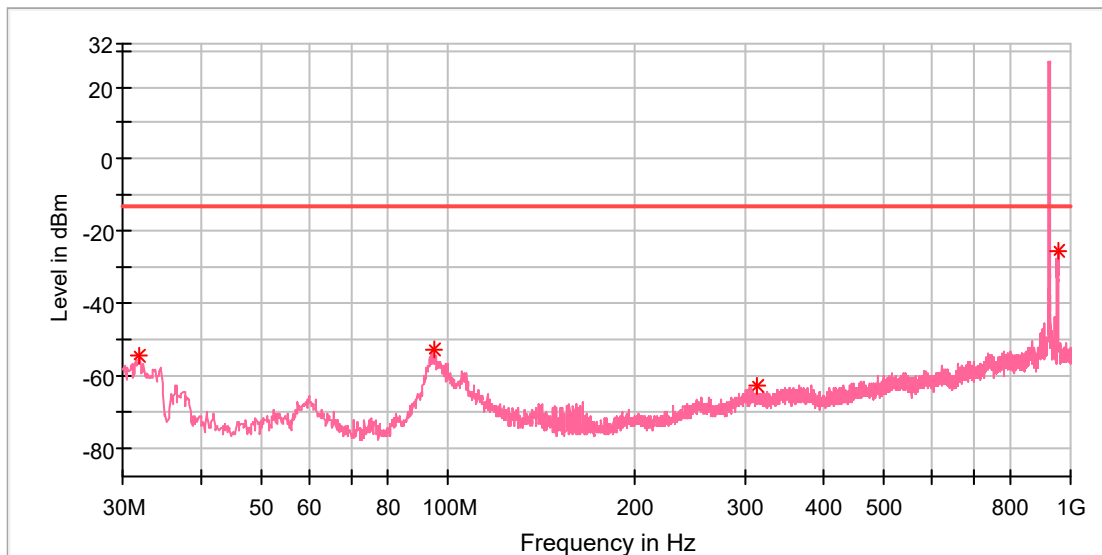
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
37.396250	-63.08	-13.00	50.08	100.0	H	319.0	-113.6
164.223750	-59.15	-13.00	46.15	100.0	H	185.0	-121.8
246.188750	-60.17	-13.00	47.17	100.0	H	267.0	-110.0
642.191250	-56.49	-13.00	43.49	100.0	H	278.0	-104.6
957.805000	-28.91	-13.00	15.91	100.0	H	24.0	-100.9

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+LTE Band 2
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 24
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

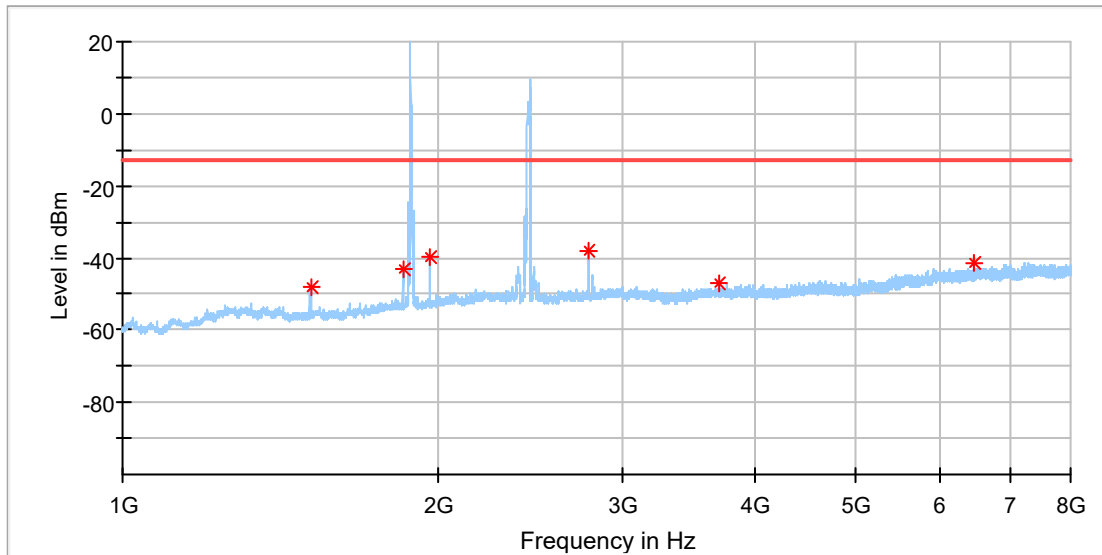
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.940000	-54.35	-13.00	41.35	100.0	V	172.0	-128.3
94.626250	-52.83	-13.00	39.83	100.0	V	59.0	-99.6
313.118750	-62.83	-13.00	49.83	100.0	V	26.0	-111.3
958.047500	-25.49	-13.00	12.49	100.0	V	30.0	-101.2

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+LTE Band 2
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 24
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

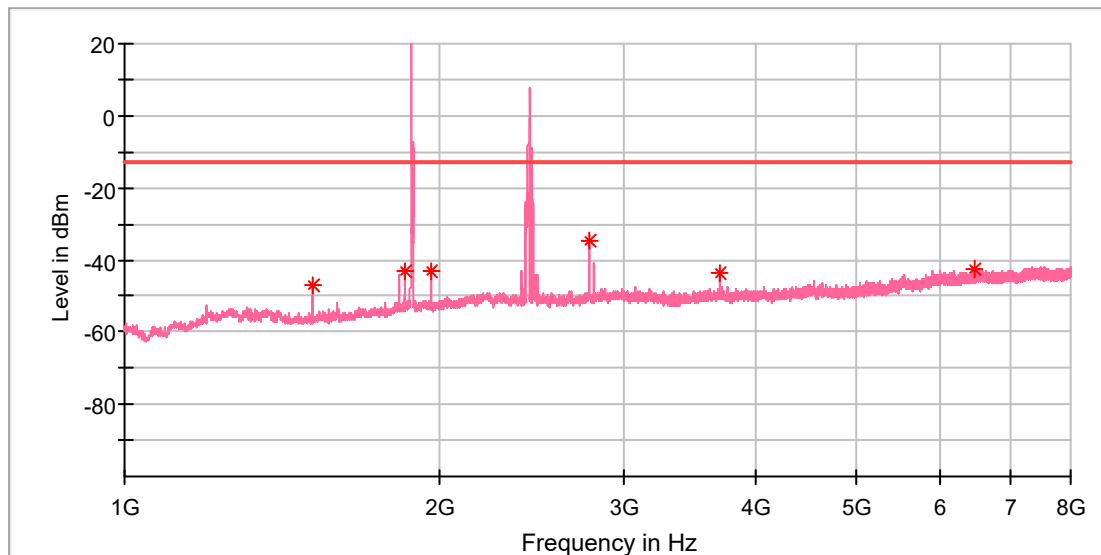
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1510.500000	-47.90	-13.00	34.90	150.0	H	186.0	-93.4
1850.000000	-42.85	-13.00	29.85	150.0	H	129.0	-90.5
1960.000000	-39.89	-13.00	26.89	150.0	H	247.0	-89.7
2775.000000	-38.25	-13.00	25.25	150.0	H	0.0	-87.6
3700.500000	-46.81	-13.00	33.81	150.0	H	4.0	-86.7
6477.000000	-41.30	-13.00	28.30	150.0	H	148.0	-81.3

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+LTE Band 2
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 24
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

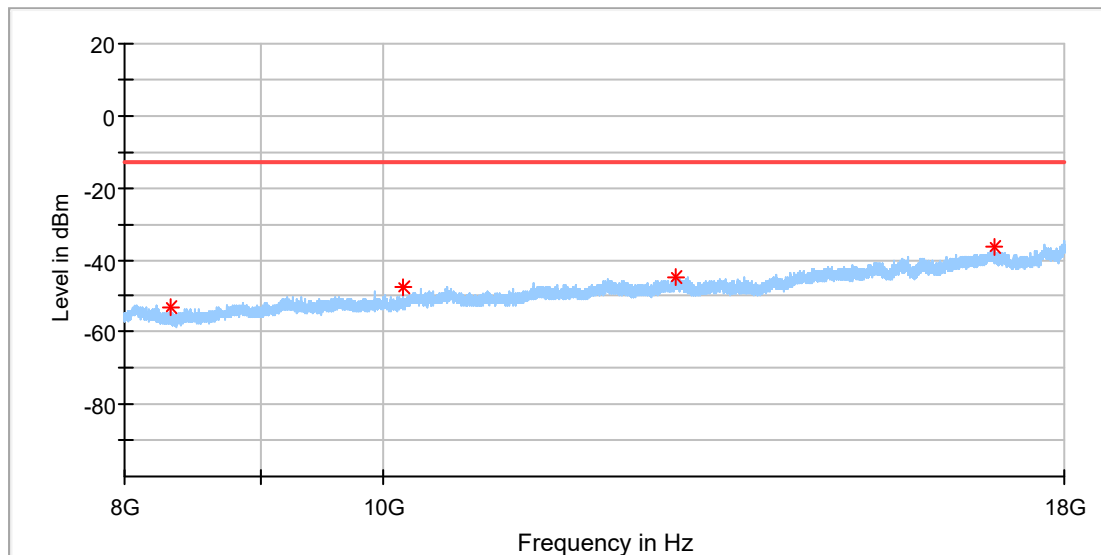
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1510.500000	-46.73	-13.00	33.73	150.0	V	85.0	-93.8
1850.500000	-43.20	-13.00	30.20	150.0	V	51.0	-90.2
1960.000000	-42.97	-13.00	29.97	150.0	V	243.0	-89.6
2775.000000	-34.96	-13.00	21.96	150.0	V	307.0	-87.3
3700.000000	-43.78	-13.00	30.78	150.0	V	298.0	-86.7
6475.000000	-42.37	-13.00	29.37	150.0	V	26.0	-81.3

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+LTE Band 2
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 24
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

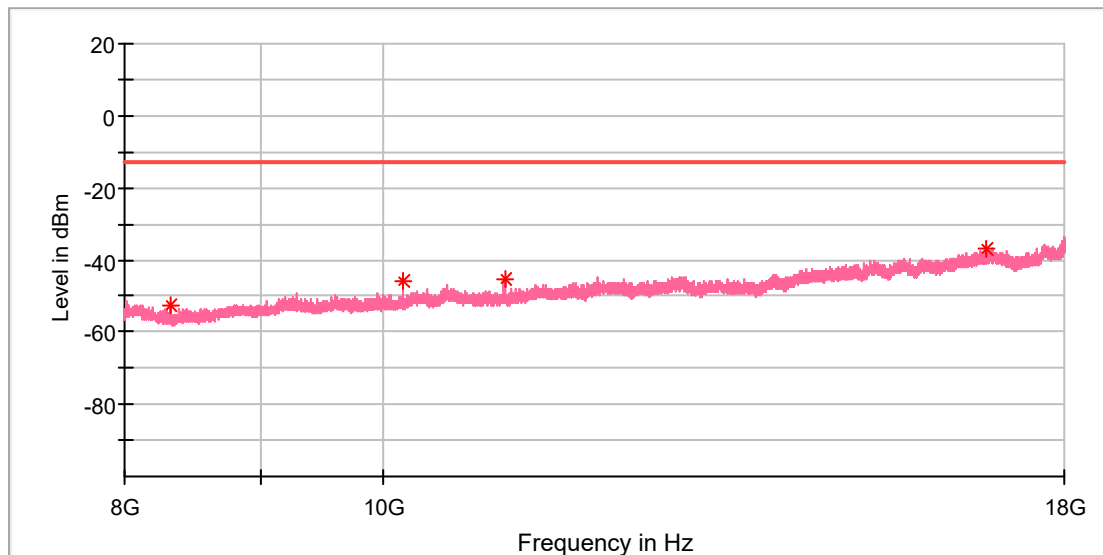
Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
8327.500000	-53.26	-13.00	40.26	150.0	H	126.0	-87.6
10175.500000	-47.78	-13.00	34.78	150.0	H	339.0	-83.3
12875.500000	-44.91	-13.00	31.91	150.0	H	62.0	-78.7
16930.000000	-36.21	-13.00	23.21	150.0	H	0.0	-73.0

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Test report no.

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EUT Information

EUT Name:	WisGate
Model:	RAK7268CV2
Test Mode:	Lora+WIFI 2.4G+LTE Band 2
Order No/Sample No:	168490719/A003755951-006
Test Voltage::	Adapter
Remark:	Temp 22 Humi:52%
Test Standard:	FCC Part 24
Tested By:	Kei Zhang
Reviewed By:	Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBm)	Limit (dBm)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
8327.000000	-52.34	-13.00	39.34	150.0	V	302.0	-87.5
10176.500000	-45.71	-13.00	32.71	150.0	V	0.0	-83.5
11104.000000	-45.40	-13.00	32.40	150.0	V	348.0	-82.8
16819.000000	-37.07	-13.00	24.07	150.0	V	341.0	-73.5

5.2 Conducted emissions

RESULT: Pass

Test Specification

Test standard	: FCC Part 15.207(a)
	: RSS-Gen Clause 8.8
Basic standard	: ANSI C63.10: 2013
Frequency range	: 150KHz - 30MHz
Classification	: Class B
Limit	: FCC Part 15.207(a)
	: RSS-Gen Table 4
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2024-07-01 - 2024-08-15
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 the following plots, only the worst case mode are shown in this report.

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Shenzhen UnionTrust Quality and Technology Co.,Ltd.

Site LAB Phase: **L1** Temperature: 24.4 °C
Limit: FCC Part15 CE-Class B_QP Power: AC120/60Hz Humidity: 53.6 %RH
EUT: WisGate Air Pressure: 99.6 kpa
M/N: RAK7268CV2
Mode: Test Mode 1:On,2.4G WIFI link+WCDMA link+Lora link,powered by AC/DC Adapter
Note:

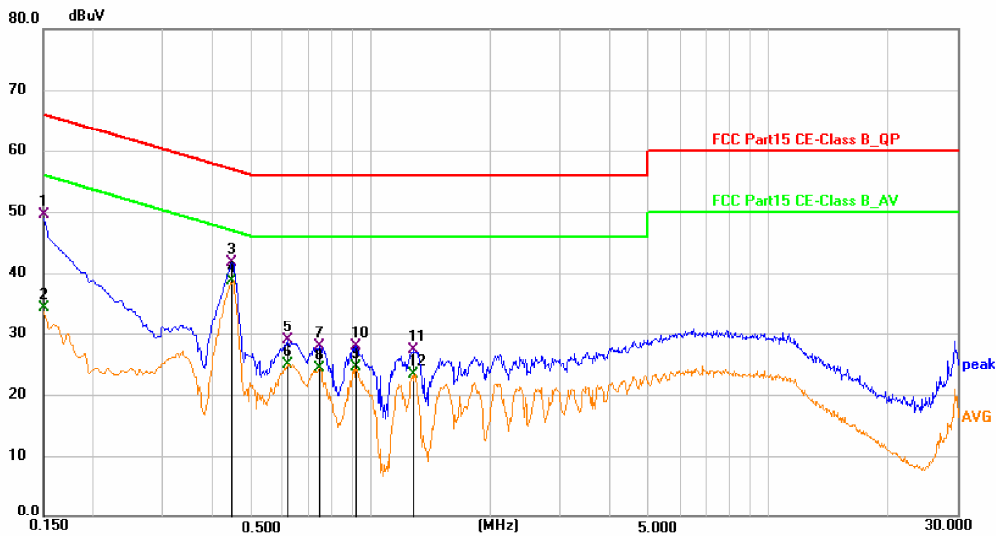
Conducted Emission Measurement

24072912929_RAK7268CV2_NEW

Data :#1

Date: 2024/8/3

Time: 18:59:49



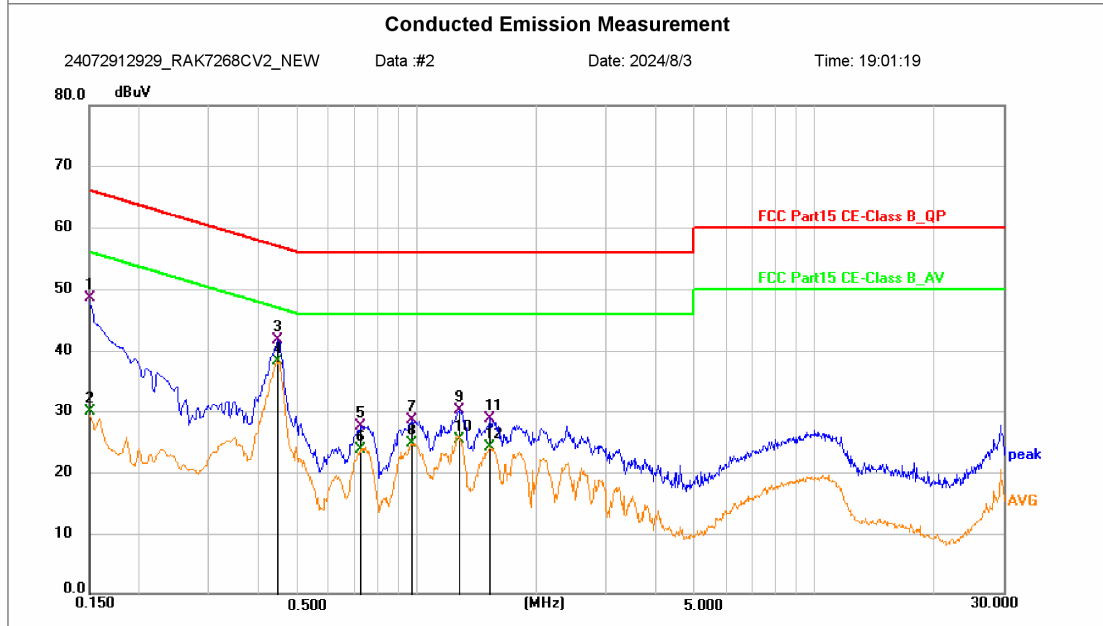
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	39.28	10.20	49.48	66.00	-16.52	QP	P	
2	0.1500	24.07	10.20	34.27	56.00	-21.73	AVG	P	
3	0.4470	31.47	10.15	41.62	56.93	-15.31	QP	P	
4 *	0.4470	28.54	10.15	38.69	46.93	-8.24	AVG	P	
5	0.6180	18.67	10.20	28.87	56.00	-27.13	QP	P	
6	0.6180	14.75	10.20	24.95	46.00	-21.05	AVG	P	
7	0.7440	17.76	10.22	27.98	56.00	-28.02	QP	P	
8	0.7440	14.05	10.22	24.27	46.00	-21.73	AVG	P	
9	0.9194	14.19	10.31	24.50	46.00	-21.50	AVG	P	
10	0.9194	17.63	10.31	27.94	56.00	-28.06	QP	P	
11	1.2884	16.92	10.31	27.23	56.00	-28.77	QP	P	
12	1.2884	13.05	10.31	23.36	46.00	-22.64	AVG	P	

*:Maximum data x:Over limit !:over margin

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Site LAB Phase: **N** Temperature: 24.4 °C
Limit: FCC Part15 CE-Class B_QP Power: AC120/60Hz Humidity: 53.6 %RH
EUT: WisGate Air Pressure: 99.6 kpa
M/N: RAK7268CV2
Mode: Test Mode 1:On,2.4G WIFI link+WCDMA link+Lora link,powered by AC/DC Adapter
Note:



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	38.40	10.19	48.59	66.00	-17.41	QP	P	
2	0.1500	19.67	10.19	29.86	56.00	-26.14	AVG	P	
3	0.4470	31.42	10.23	41.65	56.93	-15.28	QP	P	
4 *	0.4470	27.95	10.23	38.18	46.93	-8.75	AVG	P	
5	0.7215	17.28	10.24	27.52	56.00	-28.48	QP	P	
6	0.7215	13.48	10.24	23.72	46.00	-22.28	AVG	P	
7	0.9780	18.25	10.17	28.42	56.00	-27.58	QP	P	
8	0.9780	14.49	10.17	24.66	46.00	-21.34	AVG	P	
9	1.2795	19.83	10.20	30.03	56.00	-25.97	QP	P	
10	1.2795	15.15	10.20	25.35	46.00	-20.65	AVG	P	
11	1.5315	18.43	10.25	28.68	56.00	-27.32	QP	P	
12	1.5315	13.81	10.25	24.06	46.00	-21.94	AVG	P	

*:Maximum data x:Over limit !:over margin

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Test report no.

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Site LAB Phase: **N** Temperature: 23.1 °C
Limit: FCC Part15 CE-Class B_QP Power: AC120/60Hz Humidity: 58.1 %RH
EUT: WisGate Air Pressure: 99.3 kpa
M/N: RAK7268CV2
Mode: Test Mode 2:On,2.4G WIFI link+LTE link+Lora link,powered by POE Adapter
Note:

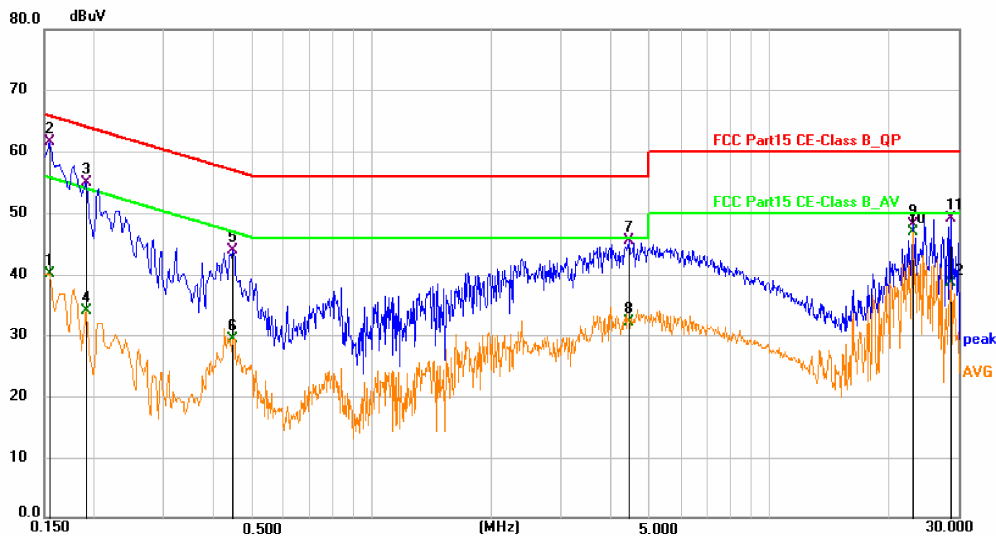
Conducted Emission Measurement

24072912929_RAK7268CV2_NEW

Data :#3

Date: 2024/8/15

Time: 15:46:39



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1544	29.92	10.18	40.10	55.76	-15.66	AVG	P	
2	0.1545	51.25	10.18	61.43	65.75	-4.32	QP	P	
3	0.1905	44.80	10.07	54.87	64.01	-9.14	QP	P	
4	0.1905	23.74	10.07	33.81	54.01	-20.20	AVG	P	
5	0.4470	33.64	10.23	43.87	56.93	-13.06	QP	P	
6	0.4470	19.13	10.23	29.36	46.93	-17.57	AVG	P	
7	4.4340	35.28	10.27	45.55	56.00	-10.45	QP	P	
8	4.4340	21.91	10.27	32.18	46.00	-13.82	AVG	P	
9	23.1270	37.42	10.77	48.19	60.00	-11.81	QP	P	
10 *	23.1270	36.08	10.77	46.85	50.00	-3.15	AVG	P	
11	28.6844	38.19	10.87	49.06	60.00	-10.94	QP	P	
12	28.6844	27.57	10.87	38.44	50.00	-11.56	AVG	P	

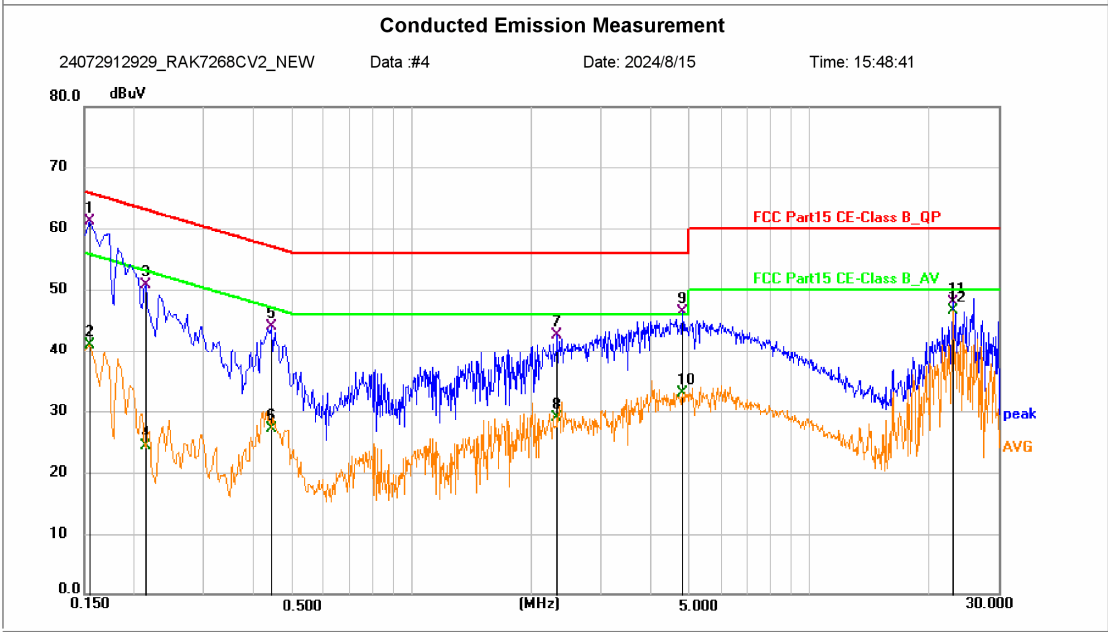
*:Maximum data x:Over limit !:over margin

24072912929_RAK7268CV2_NEWData :#3

Page: 1

Engineer Signature: linson

Site LAB	Phase: L1	Temperature: 23.1 °C
Limit: FCC Part15 CE-Class B_QP	Power: AC120/60Hz	Humidity: 58.1 %RH
EUT: WisGate		Air Pressure: 99.3 kpa
M/N: RAK7268CV2		
Mode: Test Mode 2:On,2.4G WIFI link+LTE link+Lora link,powered by POE Adapter		
Note:		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1545	50.84	10.20	61.04	65.75	-4.71	QP	P	
2	0.1545	30.61	10.20	40.81	55.75	-14.94	AVG	P	
3	0.2130	40.60	10.17	50.77	63.09	-12.32	QP	P	
4	0.2130	14.12	10.17	24.29	53.09	-28.80	AVG	P	
5	0.4425	33.73	10.15	43.88	57.01	-13.13	QP	P	
6	0.4425	17.05	10.15	27.20	47.01	-19.81	AVG	P	
7	2.3280	32.30	10.24	42.54	56.00	-13.46	QP	P	
8	2.3280	18.75	10.24	28.99	46.00	-17.01	AVG	P	
9	4.8210	36.10	10.23	46.33	56.00	-9.67	QP	P	
10	4.8210	22.62	10.23	32.85	46.00	-13.15	AVG	P	
11	23.1270	37.07	10.81	47.88	60.00	-12.12	QP	P	
12 *	23.1270	35.61	10.81	46.42	50.00	-3.58	AVG	P	

*:Maximum data x:Over limit !:over margin

6 List of Tables

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