TEST REPORT

Application No.:	SZCR2504001472AT
Applicant:	Shenzhen RAKwireless Technology Co.,Ltd.
Address of Applicant:	Room 506, Building B, New Compark, Pingshan First Road, Taoyuan Street, Nanshan District, Shenzhen, China
Equipment Under Test (EUT):	
EUT Name:	WisGate Connect
Model No.:	RAK7393C
Trade Mark:	RAK
FCC ID:	2AF6B-RAK7393C
Standard(s) :	47 CFR Part 15, Subpart B
Date of Receipt:	2025-04-14
Date of Test:	2025-04-24 to 2025-05-24
Date of Issue:	2025-06-02
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu
EMC Laboratory Manager

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Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
01		2025-06-02		Original

Authorized for issue by:				
		Benson Wang		
		Benson Wang/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		

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2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	15.107(a);Class B	Pass
Radiated Emissions (30MHz-1GHz)		ANSI C63.4:2014	15.109(a);Class B	Pass
Radiated Emissions (Above 1GHz)		ANSI C63.4:2014	15.109(g);Class B	Pass

Declaration of EUT Family Grouping:

Model No.: RAK7393C

Only the model RAK7393C (lora US915 16ch with GPS（RAK5146）+ 2.4G （CM4）+LTE （EG95-NA）) was performed test. According to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference as below:

There are two variants for this gateway series, The other remains the same. the models have two variants, with two RAK5146 lora modules (16ch) or with one RAK5146 module (8ch).

RAK7393C: lora US915 16ch* with GPS（RAK5146）+ 2.4G （CM4）+LTE （EG95-NA） power by POE or DC source 9-36V

RAK7393C: lora US915 8ch* with GPS（RAK5146）+ 2.4G （CM4）+LTE （EG95-NA） power by POE or DC source 9-36V

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3 Contents

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SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch Electrical Engineering EMC Laboratory

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4 General Information

4.1 Details of E.U.T.

Power supply:	Charging adapter information Model: RP025-4800500YG Input: 100-240VAC, 50/60Hz 0.7A Max Output: 48.0Vdc, 0.5A, 24.0W
Cable(s):	AC cable of adapter:155cm unshielded
Internal source:	Greater than 108MHz

Remark:The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Network Cable	SGS	N/A	REF. No.SEA11A00
DC power supply	ZHAOXIN	KXN-6020D	REF. No.SEA27B00
Laptop	Lenovo	T430u	REF. No.SEA18B00

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at Mains Terminals (150kHz-30MHz)	± 3.1dB
Radiated Emissions (30MHz-1GHz)	± 6.0dB for 3m; ± 5.0dB for 10m
Radiated Emissions (Above 1GHz)	± 4.6dB

Remark:
The U_{lab} (lab Uncertainty) is less than $U_{cispr/ETSI}$ (CISPR/ETSI Uncertainty), so the test results
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

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4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Conducted Emissions at Mains Terminals (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2025-05-07	2028-05-06
EMI Test Receiver	Rohde&Schwarz	ESR	SZ-WRG-M-047	2025-01-08	2026-01-07
Measurement Software	AUDIX	e3 V8.2014-6-27a	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2024-07-06	2025-07-05
LISN	Rohde&Schwarz	ENV216	SEM007-01	2024-08-15	2025-08-14
LISN	ETS-LINDGREN	3816/2	SEM007-02	2025-03-03	2026-03-02

Radiated Emissions (30MHz-1GHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2024-08-14	2025-08-13
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2023-09-16	2025-09-15
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2025-03-04	2026-03-03
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2024-07-06	2025-07-05

Radiated Emissions (Above 1GHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2025-05-07	2028-05-06
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2025-03-04	2026-03-03
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2023-07-23	2025-07-22
Microwave system amplifier	Agilent	83017A	SEM005-25	2024-09-14	2025-09-13
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2024-07-06	2025-07-05

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General used equipment					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2024-07-24	2025-07-23
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2024-07-24	2025-07-23
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2025-03-03	2026-03-02

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6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement: 47 CFR Part 15, Subpart B
Test Method: ANSI C63.4:2014

Limit:

0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

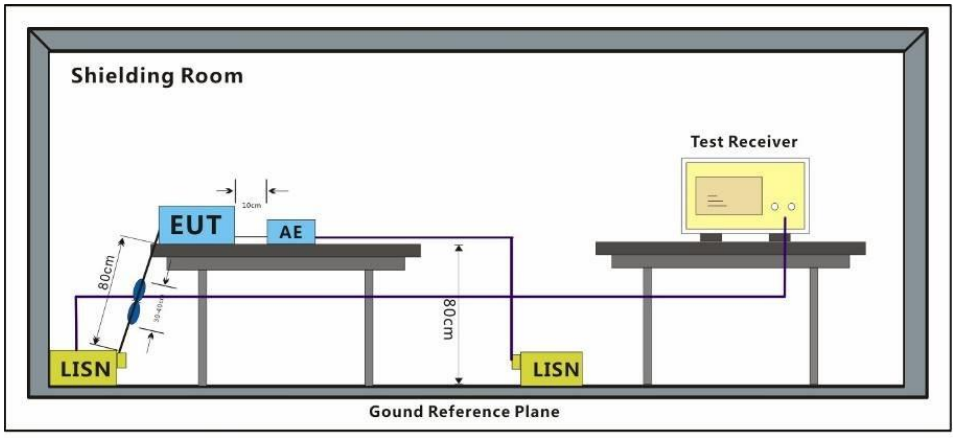
6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 22.5 °C Humidity: 44.5 % RH Atmospheric Pressure: 1020 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Normal working(RAK7393C)_Keep the EUT powered by POE or DC sourc and working normally.
Pre-scan	01	Idle mode_Keep the EUT in standby.

6.1.3 Test Setup Diagram



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6.1.4 Measurement Procedure and Data

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

Remark : Level= Read Level+ Cable Loss+ LISN Factor

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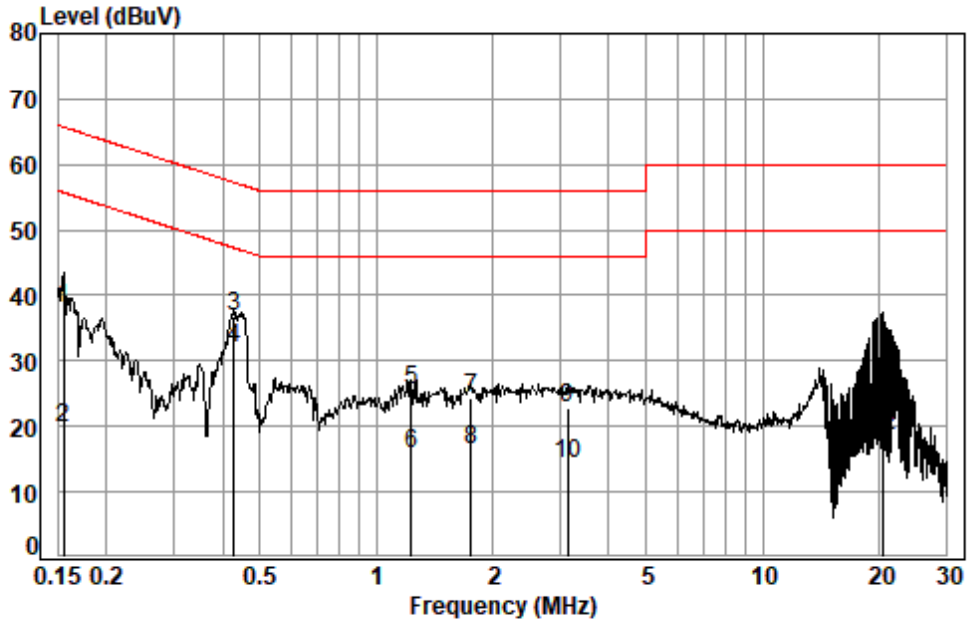
Test Mode: 00; Line: Live line



Site : Shielding Room
Condition: Line
Job No. : 01472AT
Test mode: 00

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.1548	0.06	10.19	27.66	37.91	65.74	-27.83	QP
2		0.1548	0.06	10.19	9.42	19.67	55.74	-36.07	Average
3	*	0.4282	0.08	9.63	27.16	36.87	57.29	-20.42	QP
4	*	0.4282	0.08	9.63	22.27	31.98	47.29	-15.31	Average
5		1.2357	0.09	9.58	15.81	25.48	56.00	-30.52	QP
6		1.2357	0.09	9.58	6.23	15.90	46.00	-30.10	Average
7		1.7623	0.10	9.58	14.54	24.22	56.00	-31.78	QP
8		1.7623	0.10	9.58	6.74	16.42	46.00	-29.58	Average
9		3.1231	0.11	9.65	13.17	22.93	56.00	-33.07	QP
10		3.1231	0.11	9.65	4.61	14.37	46.00	-31.63	Average
11		20.3773	0.30	10.18	9.60	20.08	60.00	-39.92	QP
12		20.3773	0.30	10.18	8.13	18.61	50.00	-31.39	Average

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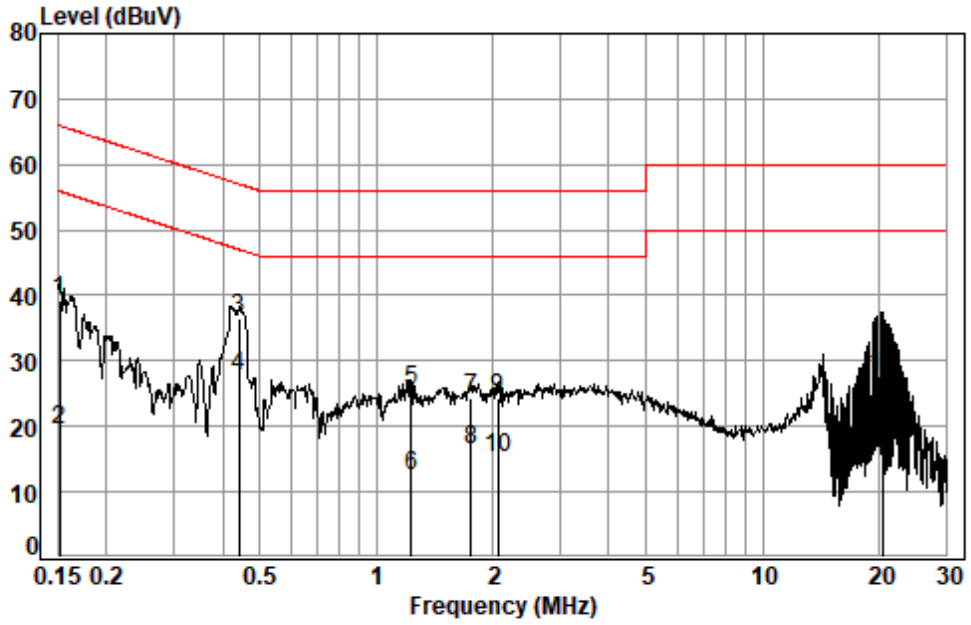
Test Mode: 00; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 01472AT
Test mode: 00

		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.1516	0.06	10.15	29.10	39.31	65.91	-26.60	QP
2		0.1516	0.06	10.15	9.34	19.55	55.91	-36.36	Average
3	*	0.4421	0.08	9.72	26.76	36.56	57.02	-20.46	QP
4	*	0.4421	0.08	9.72	17.84	27.64	47.02	-19.38	Average
5		1.2357	0.09	9.54	15.90	25.53	56.00	-30.47	QP
6		1.2357	0.09	9.54	2.92	12.55	46.00	-33.45	Average
7		1.7623	0.10	9.55	14.72	24.37	56.00	-31.63	QP
8		1.7623	0.10	9.55	6.64	16.29	46.00	-29.71	Average
9		2.0659	0.10	9.55	14.54	24.19	56.00	-31.81	QP
10		2.0659	0.10	9.55	5.67	15.32	46.00	-30.68	Average
11		20.3773	0.30	10.17	17.30	27.77	60.00	-32.23	QP
12		20.3773	0.30	10.17	6.49	16.96	50.00	-33.04	Average

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6.2 Radiated Emissions (30MHz-1GHz)

Test Requirement: 47 CFR Part 15, Subpart B
Test Method: ANSI C63.4:2014
Measurement Distance: 3m

Limit:

FREQUENCY (MHz)	dBμV/m (At 10m)	dBμV/m (At 3m)
	Class B	Class B
30MHz -88MHz	29.5	40.0
88MHz-216MHz	33.1	43.5
216MHz-960MHz	35.6	46.0
960MHz-1000MHz	43.5	54.0
Detector: Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz		

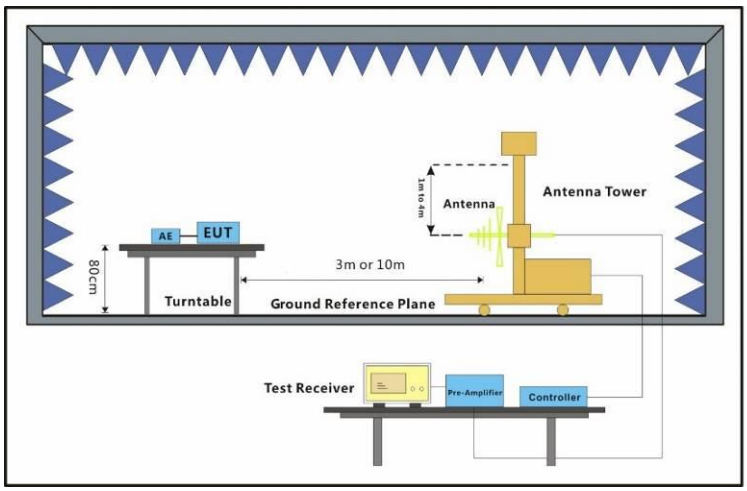
6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 23.3 °C Humidity: 45.1 % RH Atmospheric Pressure: 1020 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Normal working(RAK7393C)_Keep the EUT powered by POE or DC sourc and working normally.
Pre-scan	01	Idle mode_Keep the EUT in standby.

6.2.3 Test Setup Diagram



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6.2.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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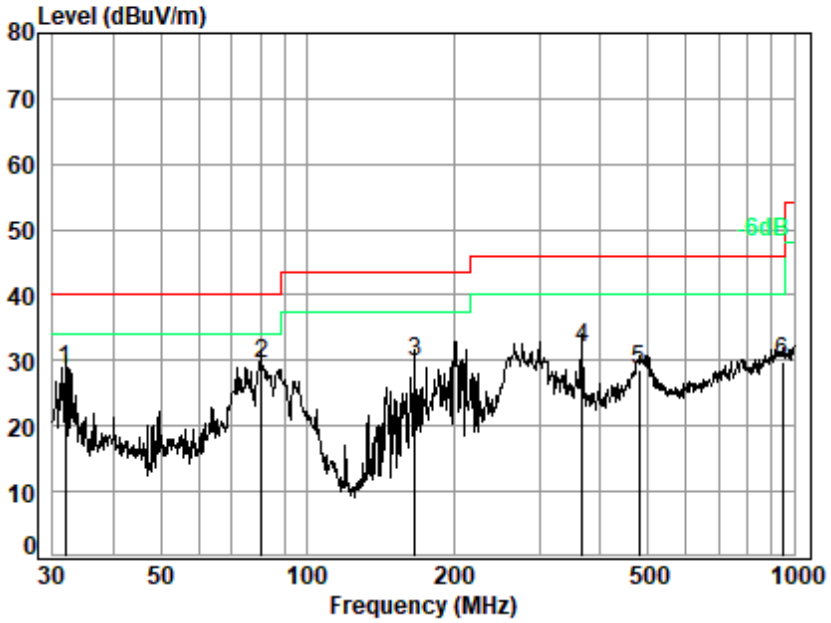
Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : 01472AT
Test Mode: 00
: DC

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	31.843	20.34	0.69	27.79	35.35	28.59	40.00	-11.41	QP
2 q	80.362	10.48	1.09	27.65	45.60	29.52	40.00	-10.48	QP
3	166.651	13.15	1.62	27.31	42.21	29.67	43.50	-13.83	QP
4	366.823	20.35	2.47	27.02	36.17	31.97	46.00	-14.03	QP
5	480.528	22.75	2.86	27.48	30.52	28.65	46.00	-17.35	QP
6	945.440	28.26	4.24	26.44	23.75	29.81	46.00	-16.19	QP

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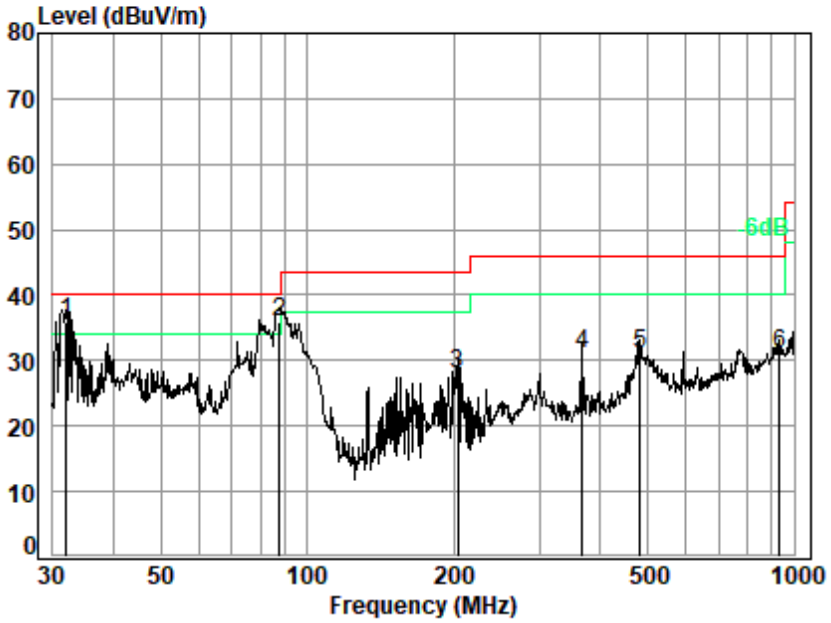
Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : 01472AT
Test Mode: 00
: DC

	Freq	Ant Factor	Cable Loss	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB	
1	31.955	20.29	0.69	27.79	42.59	35.78	40.00	-4.22	QP
2 q	87.725	11.43	1.14	27.63	51.07	36.01	40.00	-3.99	QP
3	203.523	14.41	1.78	27.16	38.98	28.01	43.50	-15.49	QP
4	366.823	20.35	2.47	27.02	35.12	30.92	46.00	-15.08	QP
5	482.216	22.80	2.86	27.49	33.00	31.17	46.00	-14.83	QP
6	935.546	28.18	4.22	26.51	25.12	31.01	46.00	-14.99	QP

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6.3 Radiated Emissions (Above 1GHz)

Test Requirement: 47 CFR Part 15, Subpart B
Test Method: ANSI C63.4:2014
Measurement Distance: 3m

Limit:

Above 1GHz	74(dBμV/m) peak, 54(dBμV/m) average at 3m distance
	83.54(dBμV/m) peak, 63.54(dBμV/m) average at 1m distance
Detector:	Peak for pre-scan (1MHz resolution bandwidth) 1GHz to 40GHz

6.3.1 E.U.T. Operation

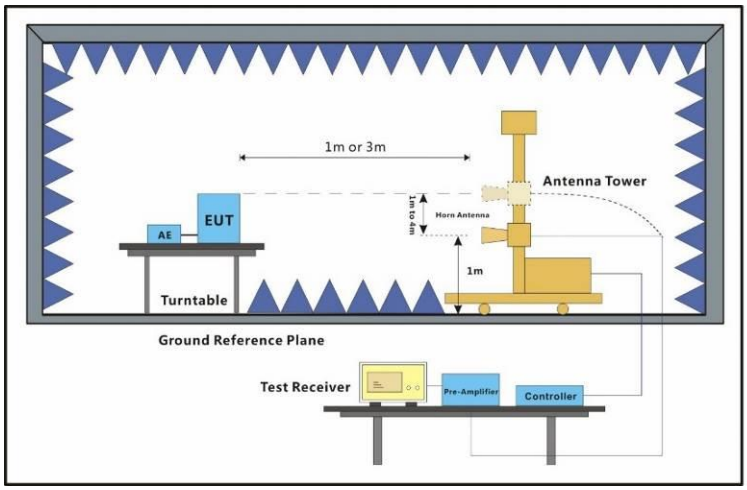
Operating Environment:

Temperature: 21.6 °C Humidity: 45.1 % RH Atmospheric Pressure: 1020 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Normal working(RAK7393C)_Keep the EUT powered by POE or DC sourc and working normally.
Pre-scan	01	Idle mode_Keep the EUT in standby.

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn antenna with 2 orthogonal polarities.

The red line show in graphic is the limit in standard used in this section.

Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

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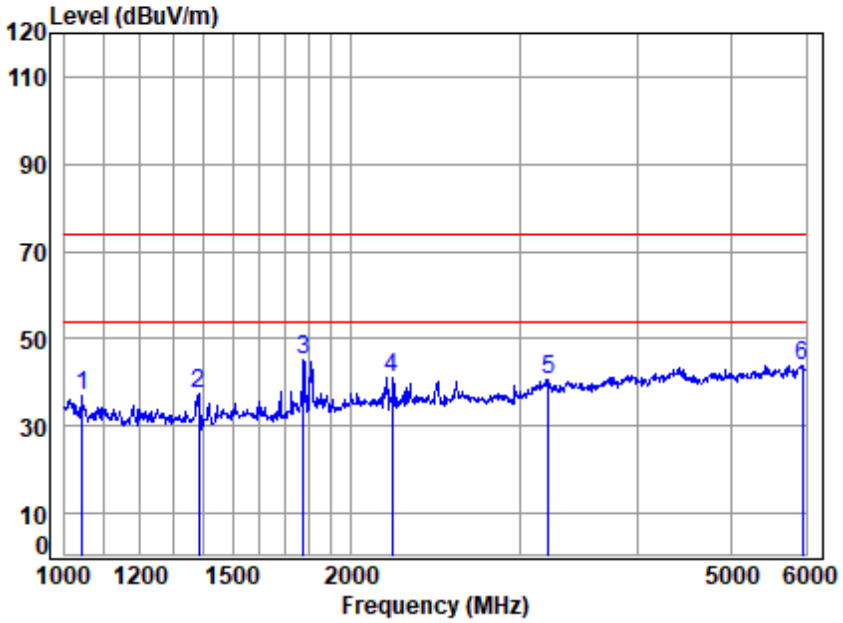
Test Mode: 00; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 01472AT/01500AT
Mode : 00
: DC

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1042.071	5.84	24.95	54.62	60.71	36.88	74.00	-37.12	Peak
2	1383.074	5.10	24.57	54.74	62.49	37.42	74.00	-36.58	Peak
3 p	1780.593	4.99	26.92	54.85	68.00	45.06	74.00	-28.94	Peak
4	2207.714	5.23	27.82	54.92	62.95	41.08	74.00	-32.92	Peak
5	3222.054	6.10	32.55	54.83	56.91	40.73	74.00	-33.27	Peak
6	5946.487	8.72	34.69	53.15	53.52	43.78	74.00	-30.22	Peak

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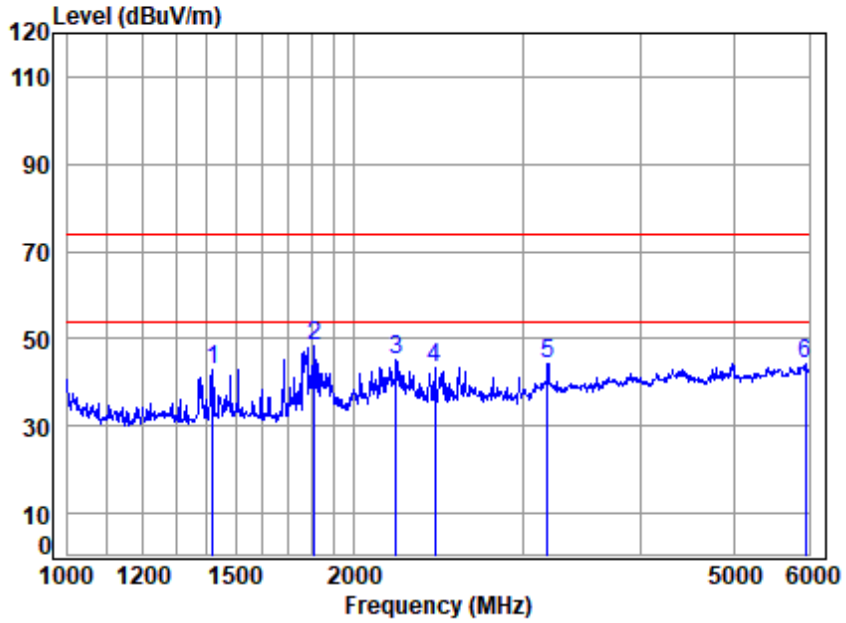
Test Mode: 00; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 01472AT/01500AT
Mode : 00
: DC

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1420.750	5.03	24.93	54.75	67.84	43.05	74.00	-30.95	Peak
2 p	1816.036	5.00	27.00	54.86	71.23	48.37	74.00	-25.63	Peak
3	2211.673	5.24	27.82	54.92	66.95	45.09	74.00	-28.91	Peak
4	2427.643	5.40	28.99	54.95	63.80	43.24	74.00	-30.76	Peak
5	3187.600	6.08	32.80	54.85	60.42	44.45	74.00	-29.55	Peak
6	5946.487	8.72	34.69	53.15	53.88	44.14	74.00	-29.86	Peak

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7 Test Setup Photo

Refer to Appendix 01 – Test Setup Photos for SZCR2504001472AT.

8 EUT Constructional Details (EUT Photos)

Refer to Appendix 01- External and Internal photos for SZCR2504001472AT

- End of the Report -

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