

TEST REPORT

Report No..... : KS2305S2533E01

FCC ID..... : 2A5SKVP31700

Applicant..... : Klimtek(Shen Zhen)Tech. Ltd

Address..... : 5A, Building 1, Tingwei Industrial Park, Xin 'an Street, Bao'an District, Shenzhen

Manufacturer..... : Klimtek(Shen Zhen)Tech. Ltd

Address..... : 5A, Building 1, Tingwei Industrial Park, Xin 'an Street, Bao'an District, Shenzhen

Product Name..... : Portable Power Station

Trademark..... : 

Model/Type reference..... : CAPTAIN 700

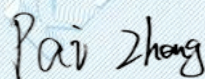
Standard..... : 47 CFR Part 15C

Date of Receipt..... : May 13, 2023

Date of Test Date..... : May 13, 2023 to June 10, 2023

Date of issue..... : June 10, 2023

Test result..... : Pass

Prepared by:
(Printed name + Signature) Pai Zheng 

Approved by:
(Printed name + Signature) Sky Dong 

Testing Laboratory Name...: KSIGN(Guangdong) Testing Co., Ltd.

Address..... : West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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1. TEST SUMMARY

1.1. Test Standards

The tests were performed according to following standards:

47 CFR Part 15C: Radiated emission limits; general requirements.

1.2. Report Version

Revised No.	Date of issue	Description
01	June 10, 2023	Original

1.3. Test Description

Test Item	Standard	Requirement	Result
Antenna requirement	47 CFR Part 15.209	Part 15.203	Pass
Conducted Emission at AC power line	47 CFR Part 15.209	47 CFR 15.207(a)	Pass
Emissions in restricted frequency bands (below 30MHz)	47 CFR Part 15.209	47 CFR 15.209	Pass
Emissions in restricted frequency bands (30MHz - 1GHz)	47 CFR Part 15.209	47 CFR 15.209	Pass

1.4. Test Facility

KSIGN(Guangdong) Testing Co., Ltd.

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, China

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

CNAS-Lab Code: L13261

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 5457.01

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing

ISED#: 25693 CAB identifier.: CN0096

KSIGN(Guangdong) Testing Co., Ltd. has been listed by Innovation, Science and Economic Development Canada to perform electromagnetic emission measurement.

FCC-Registration No.: 294912 Designation Number: CN1328

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

1.5. Measurement Uncertainty

Test Items	Measurement Uncertainty
Conducted Emission (150k-30MHz)	$\pm 3.34\text{dB}$
RSE	$\pm 5.7\text{dB}$

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

2. GENERAL INFORMATION

2.1. General Description Of EUT

Test Sample Number:	1-1(Normal Sample), 1-2(Engineering Sample)
Product Name:	Portable Power Station
Trademark:	
Model / Type reference:	CAPTAIN 700
Model Difference:	N/A
Power Supply:	Input: AC 120V~60Hz Battery: DC 22.4V Wireless Charging Output: 10W Max
Operation Frequency:	115KHz-205KHz
Modulation Type:	ASK
Antenna Type:	Loop coil antenna
Antenna Gain:	0 dBi
Note: For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.	

2.2. Accessory Equipment Information

Title	Manufacturer	Model No.	Serial No.
Wireless charging load	EESON	2S	N/A

2.3. Description of Test Modes

No.	Title	Description of Mode
Test Mode1	Charging+Wireless charging (10W)	N/A
Test Mode2	Standby	N/A
Note: All test modes were pre-tested, The Mode 1 was the worst case and only the data of the worst case record in this report.		

2.4. Measurement Instruments List

Conducted Emission at AC power line				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
LISN	R&S	ENV432	1326.6105.02	2024-02-17
EMI Test Receiver	R&S	ESR	102524	2024-02-17
Manual RF Switch	JS TOYO	/	MSW-01/002	2024-02-17
ISN CAT6	Schwarzbeck	CAT5 8158	227	2024-02-17
Color Signal Generator	Philips	PM5418	672926	2024-02-17
Power Absorbing Clamp	R&S	MDS-21	100925	2024-02-19

Emissions in restricted frequency bands (below 30MHz)				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Color Signal Generator	Philips	PM5418	672926	2024-02-17
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2025-02-18
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2024-02-17
Broadcast Television Signal Generator	R&S	SFE100	141038	2024-02-17
Analog Signal Generator	Agilent	8648A	3847M00445	2024-02-17
EMI Test Receiver	R&S	ESR	102525	2024-02-17
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2024-02-19
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2026-02-19
Pre-Amplifier	EMCI	EMC051835SE	980662	2024-02-17
Spectrum Analyzer	Keysight	N9020A	MY46471971	2024-02-17

Emissions in restricted frequency bands (30MHz - 1GHz)				
Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
Color Signal Generator	Philips	PM5418	672926	2024-02-17
Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	1230	2025-02-18
Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	2024-02-17
Broadcast Television Signal Generator	R&S	SFE100	141038	2024-02-17
Analog Signal Generator	Agilent	8648A	3847M00445	2024-02-17
EMI Test Receiver	R&S	ESR	102525	2024-02-17
Loop Antenna	Beijin ZHINAN	ZN30900C	18050	2024-02-19
Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	2026-02-19
Pre-Amplifier	EMCI	EMC051835SE	980662	2024-02-17
Spectrum Analyzer	Keysight	N9020A	MY46471971	2024-02-17

TRF RF_R1

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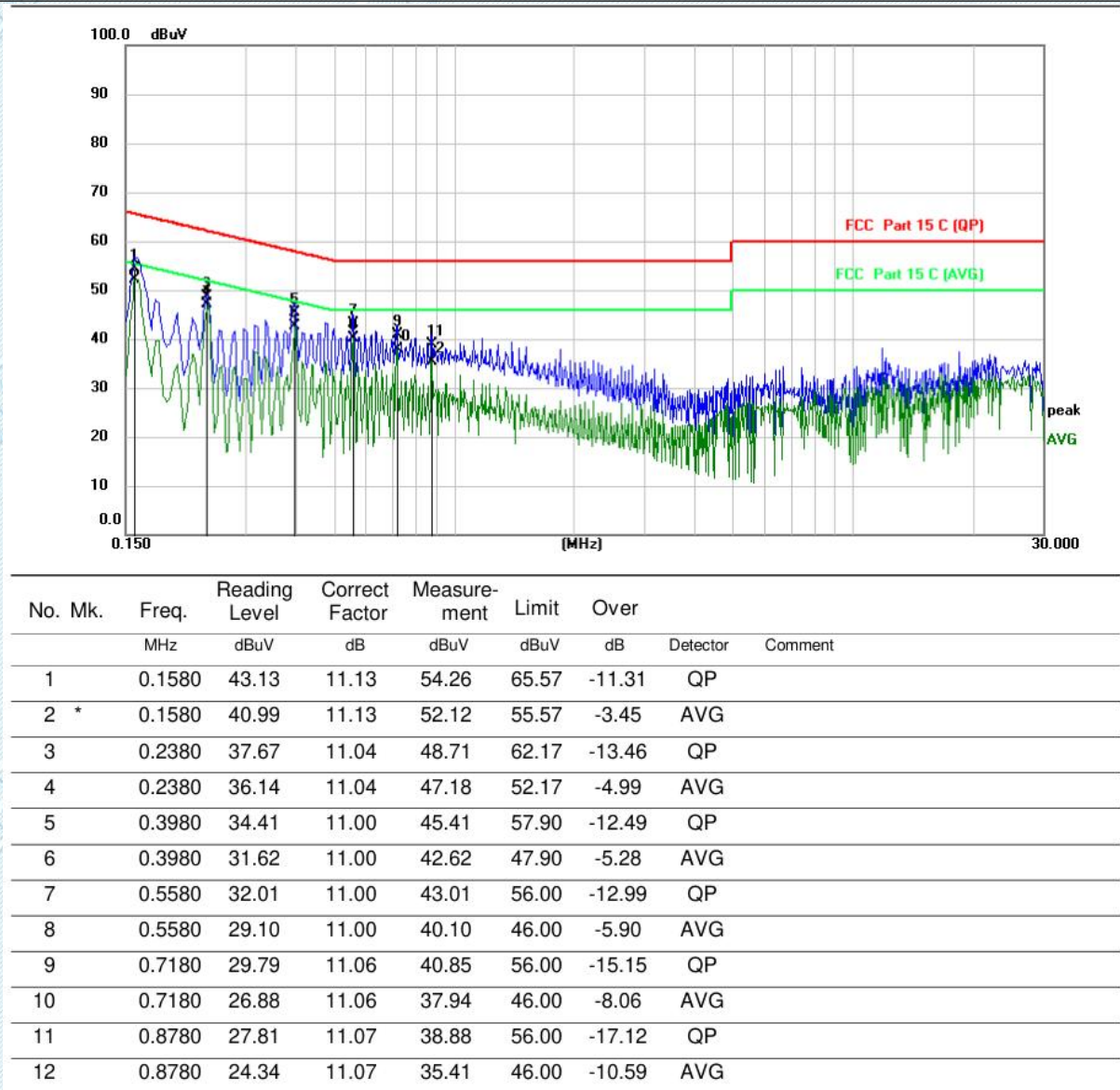
3. Evaluation Results (Evaluation)

3.1. Antenna requirement

Test Requirement:	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.
Antenna Information	The antenna used in this product is a Coil Antenna.

4.1.3. Test Data:

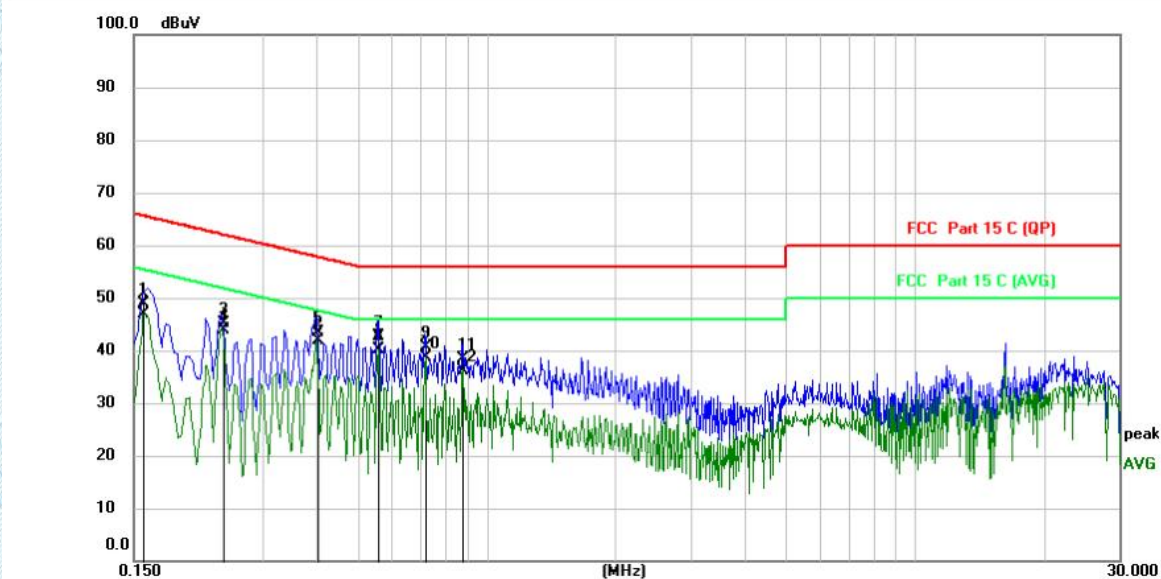
Test Mode1 / Line: Line



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Test Mode1 / Line: Neutral


No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.1580	37.67	11.12	48.79	65.57	-16.78	QP	
2	0.1580	35.69	11.12	46.81	55.57	-8.76	AVG	
3	0.2420	34.22	11.03	45.25	62.03	-16.78	QP	
4	0.2420	32.94	11.03	43.97	52.03	-8.06	AVG	
5	0.4020	32.40	10.99	43.39	57.81	-14.42	QP	
6	0.4020	30.82	10.99	41.81	47.81	-6.00	AVG	
7	0.5580	31.60	11.01	42.61	56.00	-13.39	QP	
8 *	0.5580	29.17	11.01	40.18	46.00	-5.82	AVG	
9	0.7180	29.63	11.04	40.67	56.00	-15.33	QP	
10	0.7180	27.49	11.04	38.53	46.00	-7.47	AVG	
11	0.8780	27.21	11.07	38.28	56.00	-17.72	QP	
12	0.8780	25.18	11.07	36.25	46.00	-9.75	AVG	

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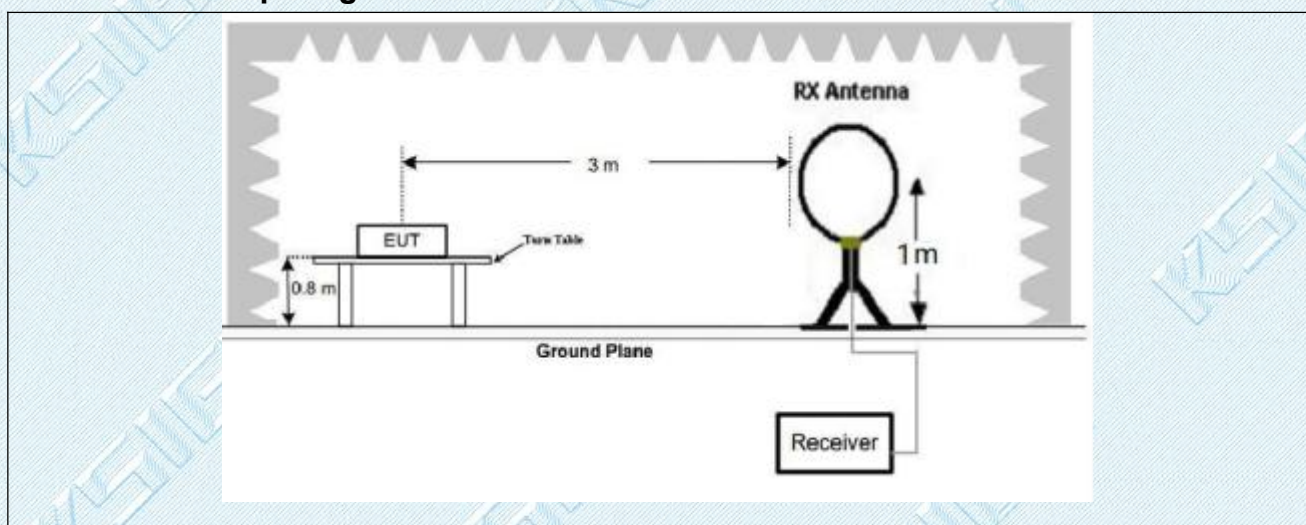
4.2. Emissions in restricted frequency bands (below 30MHz)

Test Requirement:	47 CFR 15.209		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.			
Test Method:	Radiated emissions tests		
Procedure:	ANSI C63.10-2013 section 6.6.4		

4.2.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.7 °C
Humidity:	42.1 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1, Test Mode2

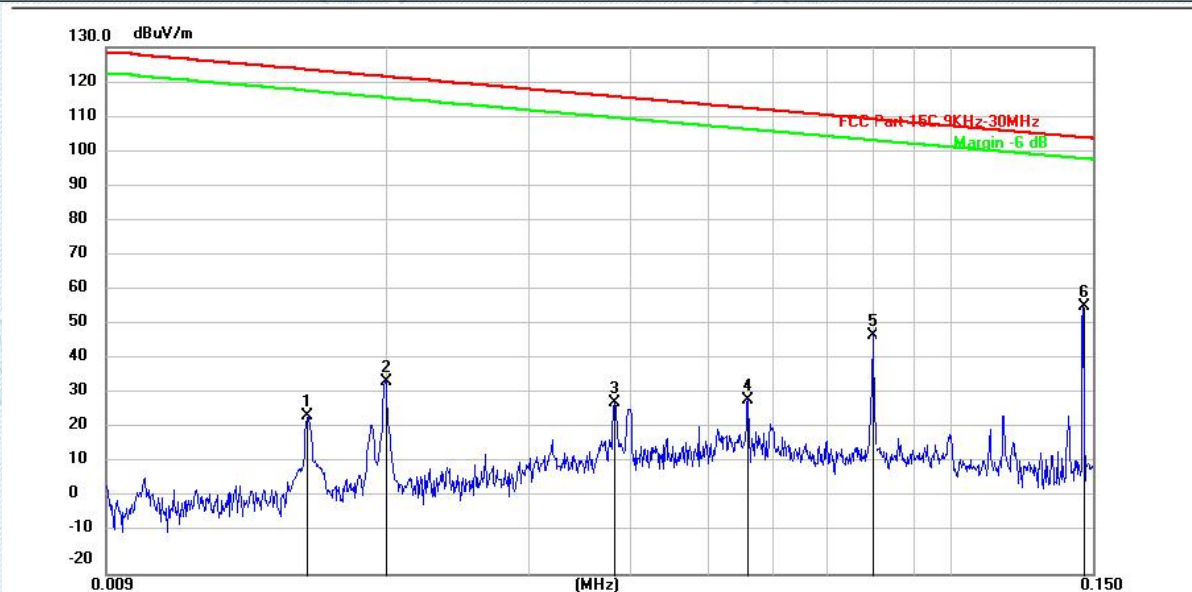
4.2.2. Test Setup Diagram:



Note: Correct Factor=Antenna Factor + Cable Loss -Preamplifier Factor

4.2.3. Test Data:

Test Model1 / Face / 9KHz-150KHz

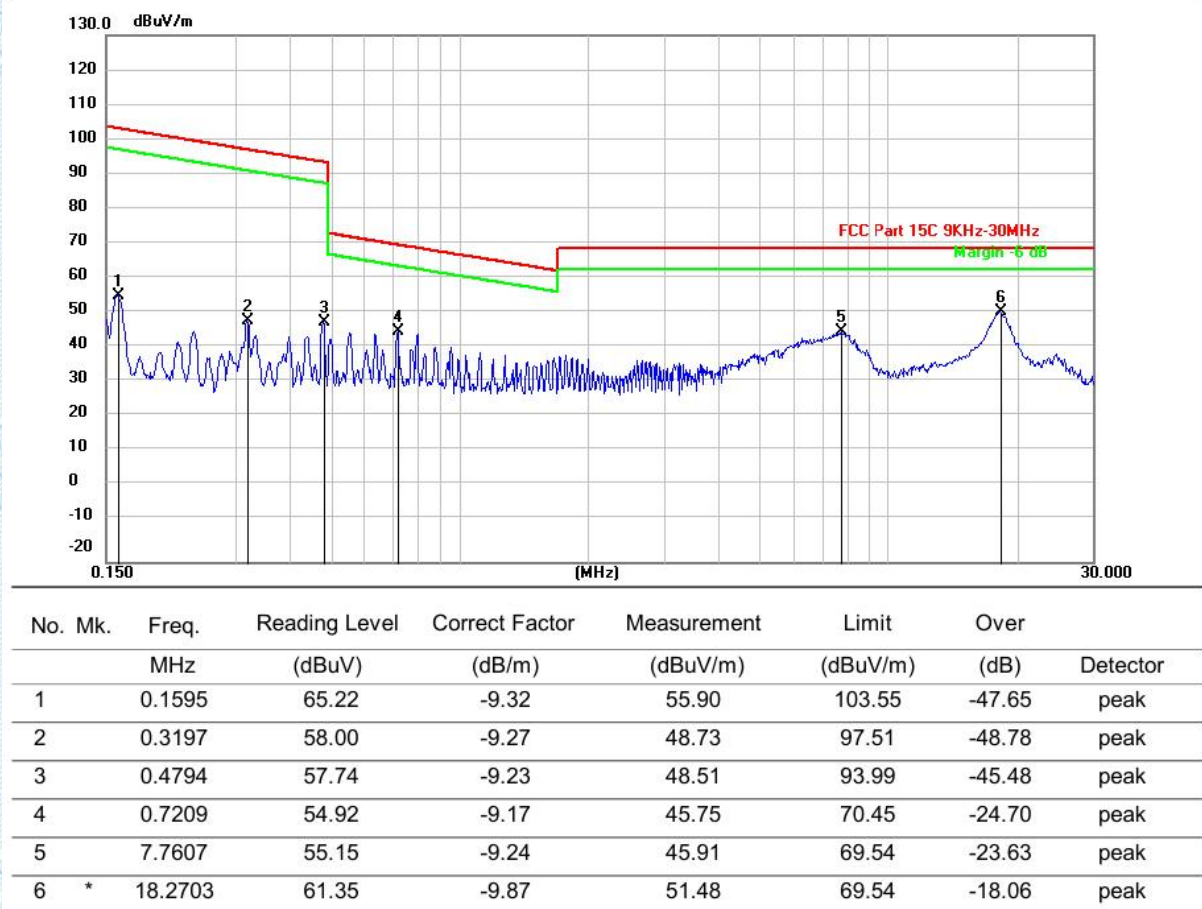


No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measurement (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector
1		0.0159	34.19	-9.07	25.12	123.58	-98.46	peak
2		0.0200	44.03	-9.05	34.98	121.58	-86.60	peak
3		0.0383	37.94	-8.92	29.02	115.94	-86.92	peak
4		0.0560	38.68	-8.98	29.70	112.64	-82.94	peak
5		0.0800	57.40	-9.15	48.25	109.54	-61.29	peak
6	*	0.1459	65.64	-9.41	56.23	104.32	-48.09	peak

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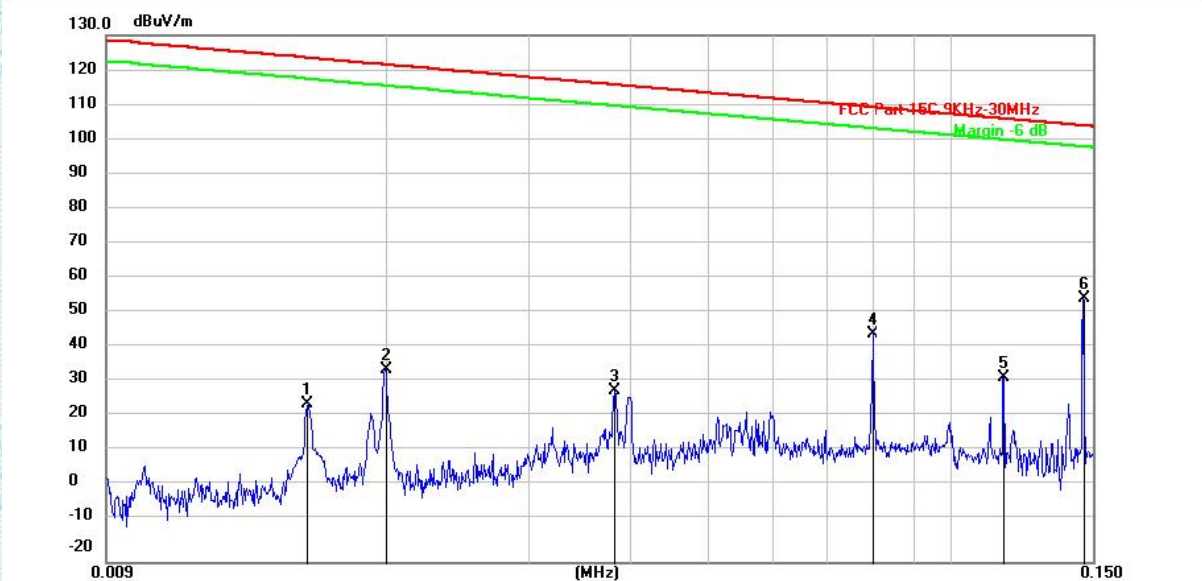
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Test Mode1 / Face / 150KHz-30MHz


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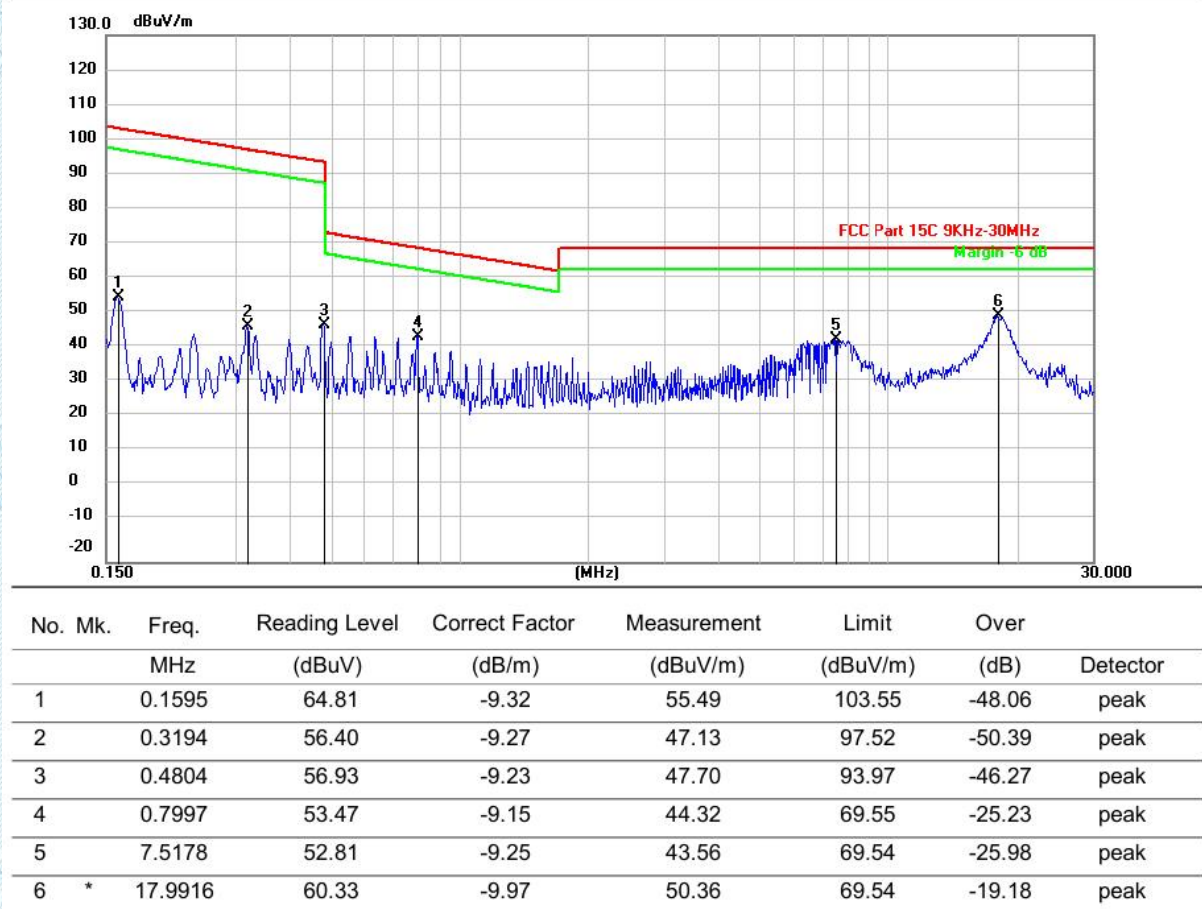
Test Mode1 / Side / 9KHz-150KHz


No.	Mk.	Freq. MHz	Reading Level (dBuV)	Correct Factor (dB/m)	Measurement (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector
1		0.0159	34.19	-9.07	25.12	123.58	-98.46	peak
2		0.0200	44.03	-9.05	34.98	121.58	-86.60	peak
3		0.0383	37.94	-8.92	29.02	115.94	-86.92	peak
4		0.0800	54.40	-9.15	45.25	109.54	-64.29	peak
5		0.1164	41.82	-9.17	32.65	106.29	-73.64	peak
6	*	0.1459	64.51	-9.41	55.10	104.32	-49.22	peak

TRF RF_R1

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Test Mode1 / Side / 150KHz-30MHz


TRF RF_R1

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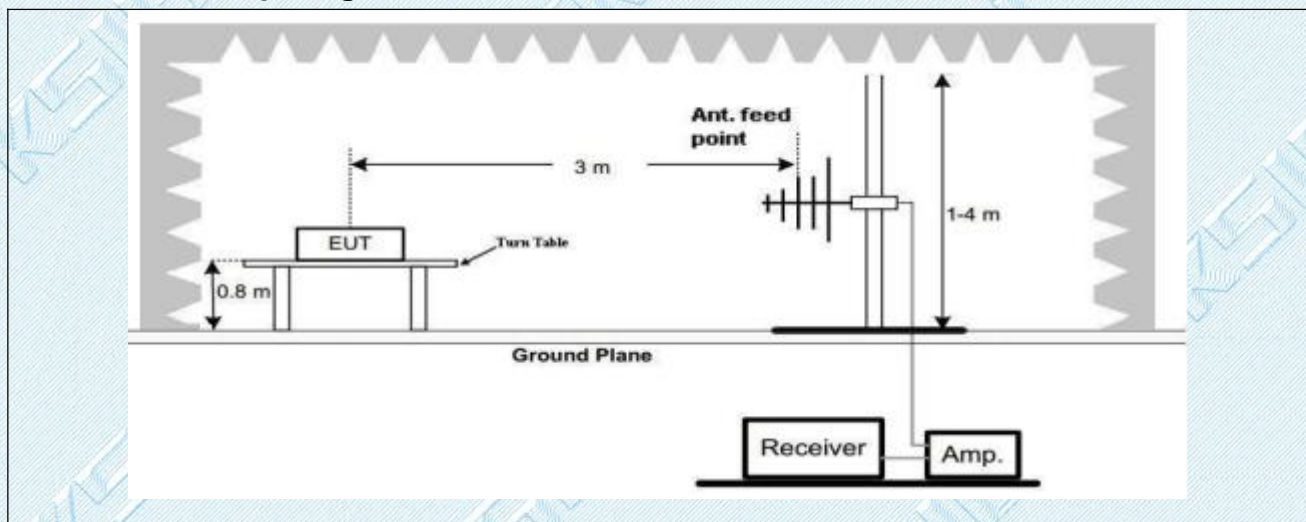
4.3. Emissions in restricted frequency bands (30MHz - 1GHz)

Test Requirement:	47 CFR 15.209		
Test Limit:	Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
	0.009-0.490	2400/F(kHz)	300
	0.490-1.705	24000/F(kHz)	30
	1.705-30.0	30	30
	30-88	100 **	3
	88-216	150 **	3
	216-960	200 **	3
	Above 960	500	3
** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§ 15.231 and 15.241. As shown in § 15.35(b), for frequencies above 1000 MHz, the field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.			
Test Method:	Radiated emissions tests		
Procedure:	ANSI C63.10-2013 section 6.6.4		

4.3.1. E.U.T. Operation:

Operating Environment:	
Temperature:	24.7 °C
Humidity:	42.1 %
Atmospheric Pressure:	102 kPa
Final test mode:	Test Mode1, Test Mode2

4.3.2. Test Setup Diagram:



Note:

- 1). Level (dBμV/m)= Reading (dBμV)+ Factor (dB/m)
- 2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)
- 3). Margin(dB) = Limit (dBμV/m) - Level (dBμV/m)

4.3.3. Test Data:

Test Mode1 / Polarization: Horizontal

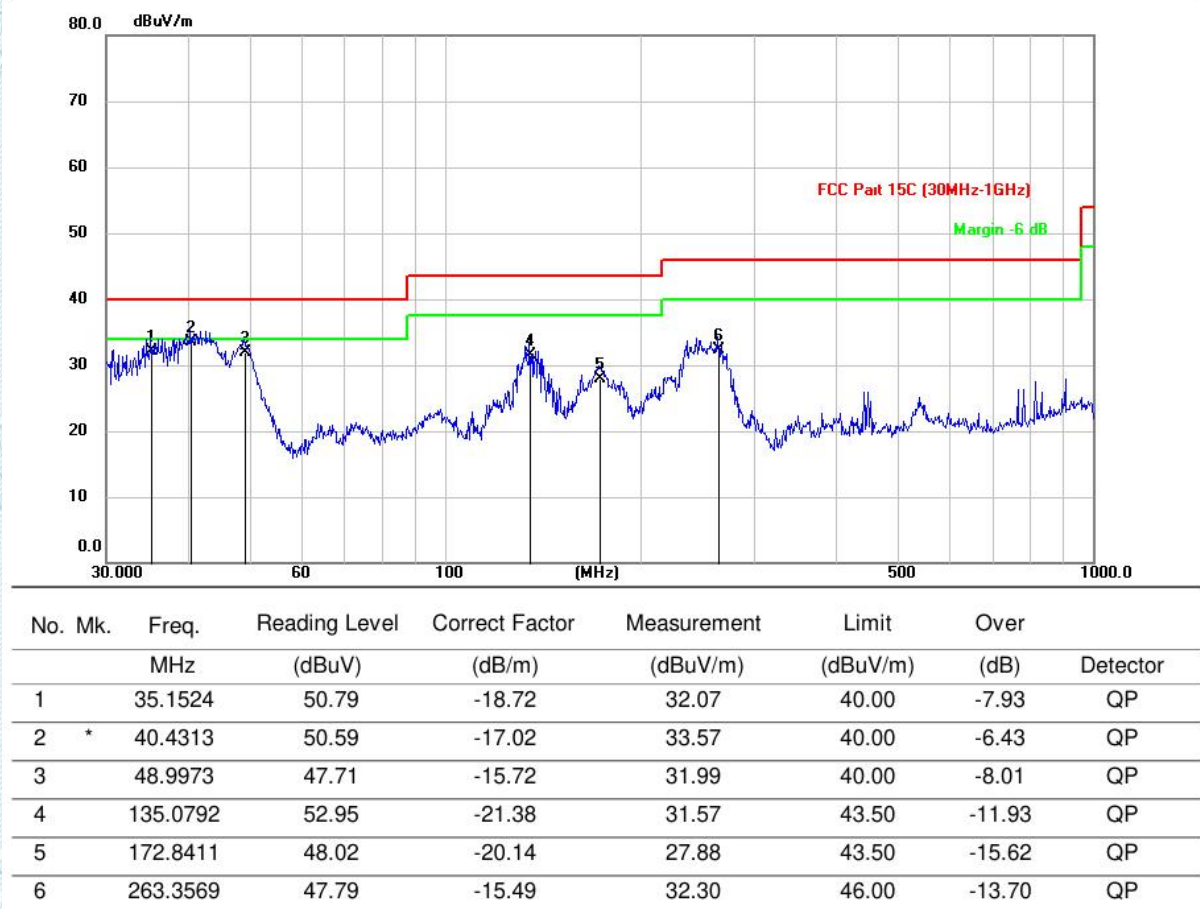


No.	Mk.	Freq. MHz	Reading Level (dBμV)	Correct Factor (dB/m)	Measurement (dBμV/m)	Limit (dBμV/m)	Over (dB)	Detector
1		48.5015	34.26	-15.76	18.50	40.00	-21.50	QP
2		135.3162	51.70	-21.37	30.33	43.50	-13.17	QP
3		183.5219	49.36	-18.83	30.53	43.50	-12.97	QP
4		218.2319	53.01	-17.19	35.82	46.00	-10.18	QP
5	*	247.5082	55.91	-15.84	40.07	46.00	-5.93	QP
6		299.4208	44.79	-14.67	30.12	46.00	-15.88	QP

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Test Mode1 / Polarization: Vertical


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5. EUT TEST PHOTOS

Conducted Emission at AC power line



Emissions in restricted frequency bands (below 30MHz)



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Emissions in restricted frequency bands (30MHz - 1GHz)

TRF RF_R1

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6. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Reference to KS2305S2533E_Appendix_Photos of EUT constructional.

--THE END--