

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

SHEM-TRF-001 Rev. 02 Sep01, 2023

Report No.: SHCR230600132301

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TEST REPORT

Application No.: SHCR2306001323PT
FCC ID: 2BE24E1500
Applicant: Jiangsu Jianghuai Engine Co., Ltd
Address of Applicant: No.58 Xiwang South Road, Economy developmental district, Yancheng, 224007, Jiangsu, China
Manufacturer: Jiangsu Jianghuai Engine Co., Ltd
Address of Manufacturer: No.58 Xiwang South Road, Economy developmental district, Yancheng, 224007, Jiangsu, China
Factory: Jiangsu Jianghuai Engine Co., Ltd
Address of Factory: No.58 Xiwang South Road, Economy developmental district, Yancheng, 224007, Jiangsu, China

Equipment Under Test (EUT):

EUT Name: portable power station
Model No.: E1500
Standard(s) : 47 CFR Part 15, Subpart C
Date of Receipt: 2023-06-29
Date of Test: 2023-06-30 to 2024-01-02
Date of Issue: 2024-01-02

Test Result:	Pass*
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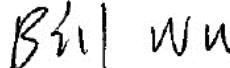
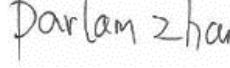
* In the configuration tested, the EUT complied with the standards specified above.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record			
Version	Description	Date	Remark
00	Original	2024-01-02	/

Authorized for issue by:			
Tested By		 Bill Wu	
		Bill Wu/Project Engineer	
Approved By		 Parlam Zhan	
		Parlam Zhan / Reviewer	

2 Test Summary

Radio Spectrum Technical Requirement				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C	N/A	47 CFR Part 15, Subpart C 15.203	Pass

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
20dB Bandwidth	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass
Radiated Emissions (9KHz-30MHz)		ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Emissions (30MHz-1GHz)		ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	Input:AC 100-120V 50/60Hz,330W max AC Output:120VAC,60Hz,1500W QC3.0 Output:5~20VDC,3A USB TYPE A Output: 5VDC,2.4A USB TYPE C Output:5~20VDC,3A,20V,5A DC Output:12VDC,3A Cigarette lighter Output:12VDC,10A Wireless Output:15W max
Test Voltage:	DC 5V
Operation frequency:	126.6KHz
Antenna type:	Inductive Loop Coil Antenna
Modulation Type:	Load Modulation

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Load Resistance	--	--	--

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty cycle	0.4%
4	Occupied Bandwidth	3%
5	RF Radiated power	5.2dB (Below 1GHz) 5.9dB (Above 1GHz)
6	Radiated Spurious emission test	4.2dB (Below 30MHz) 4.5dB (30MHz-1GHz) 5.1dB (1GHz-6GHz) 5.4dB (6GHz-18GHz)
7	Temperature test	1°C
8	Humidity test	3%
9	Supply voltages	1.5%
10	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency,

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highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).

2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

3. Sample source: sent by customer.

4.5 Test Facility

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

- **A2LA (Certificate No. 6332.01)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

- **FCC (Designation Number: CN1301)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

- **ISED (CAB Identifier: CN0020)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 8617A

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
RF Radiated Test					
EMI test Receiver	R&S	ESU40	SHEM051-1	2023-12-19	2024-12-18
Spectrum Analyzer	R&S	FSP-30	SHEM002-1	2023-12-19	2024-12-18
Communication Tester	R&S	CMW500	SHEM268-1	2023-06-01	2024-05-31
Loop Antenna (9kHz-30MHz)	Schwarzbeck	FMZB1519	SHEM135-1	2023-12-19	2024-12-18
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM048-1	2023-09-03	2025-09-02
Antenna (25MHz-2GHz)	Schwarzbeck	VULB9168	SHEM202-1	2023-04-17	2025-04-16
Horn Antenna (1-18GHz)	Schwarzbeck	HF906	SHEM009-1	2022-08-11	2024-08-10
Horn Antenna (1-18GHz)	Schwarzbeck	BBHA9120D	SHEM050-1	2023-09-03	2025-09-02
Horn Antenna (14-40GHz)	Schwarzbeck	BBHA 9170	SHEM049-1	2023-09-03	2025-09-02
Pre-Amplifier	HP	8447D	SHEM236-1	2023-12-19	2024-12-18
High-amplifier (14-40GHz)	Schwarzbeck	10001	SHEM049-2	2023-12-19	2024-12-18
Band Filter	LORCH	9BRX-875/X150	SHEM156-1	/	/
Band Filter	LORCH	13BRX-1950/X500	SHEM083-2	/	/
Band Filter	LORCH	5BRX-2400/X200	SHEM155-1	/	/
Band Filter	LORCH	5BRX-5500/X1000	SHEM157-2	/	/
High pass Filter	Wainwright	WHK3.0/18G	SHEM157-1	/	/
High pass Filter	Wainwright	WHKS1700	SHEM157-3	/	/
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2023-05-06	2026-05-05
RE test Cable	/	PT18-NMNM-10M	SHEM217-2	2023-12-19	2024-12-18
Test software	ESE	E3	Version: 6.111221a	/	/

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

6.1.2 Conclusion

15.203 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, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

EUT Antenna:

The antenna is inductive loop coil antenna and no consideration of replacement.

Antenna location: Refer to Internal photos

7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215

Test Method: ANSI C63.10 (2013) Section 6.9

7.1.1 E.U.T. Operation

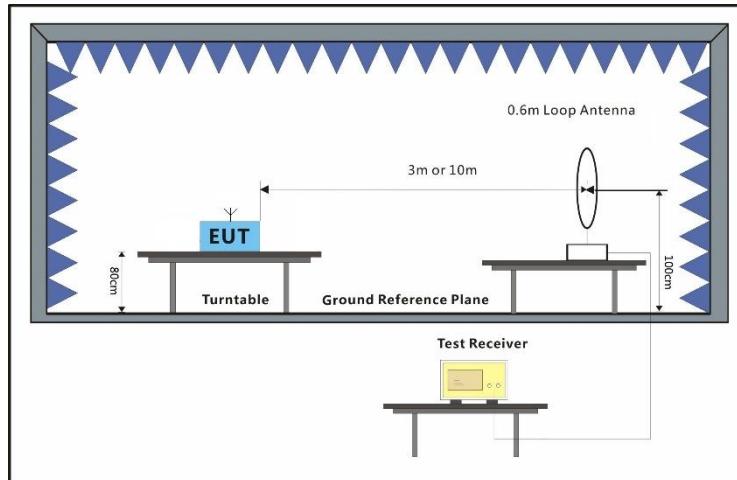
Operating Environment:

Temperature: 16.0 °C Humidity: 44.5 % RH Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	Wireless Output (The load shall be set at full load (15W)).
	01	Wireless Output (The load shall be set at half load (7.5W)).
	02	Wireless Output (The load shall be set at empty load (0W)).
Final test	00	Wireless Output (The load shall be set at full load (15W)).

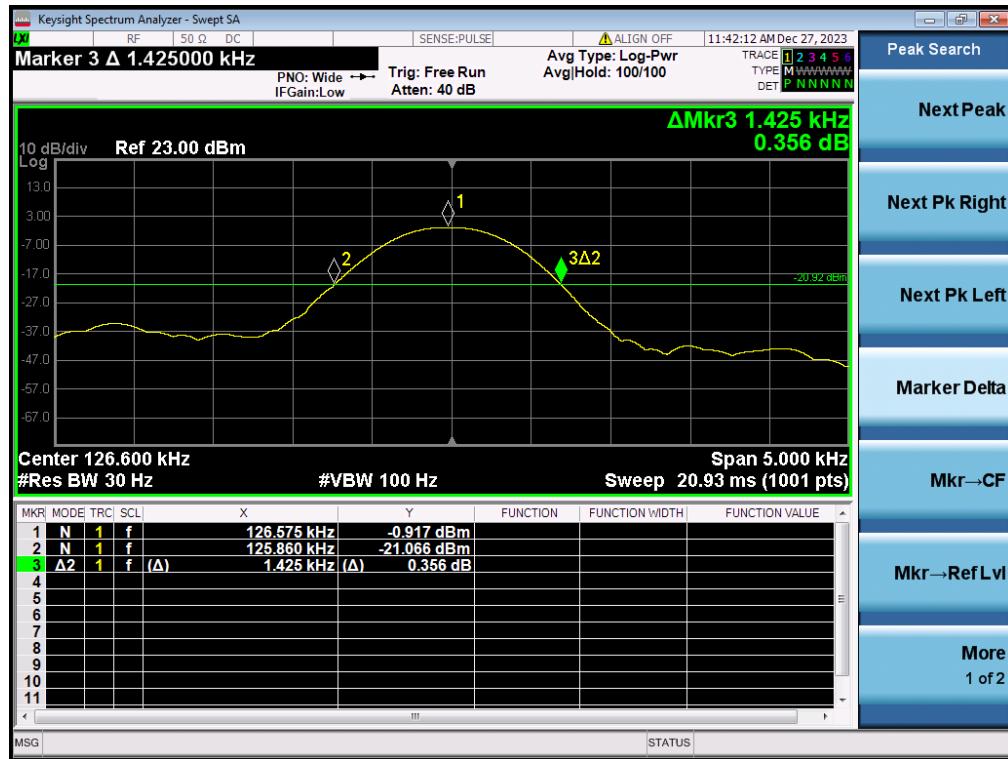
7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Frequency(kHz)	20dB bandwidth (Hz)	Result
126.6	1425	Pass

Test plot as follows:



7.2 Radiated Emissions (9kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4

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

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.

If field strength is measured at only a single point, then that point shall be at the radial from the EUT that produces the maximum emission at the frequency being measured, as described in 5.4. If that point is closer to the EUT than $\lambda/2\pi$ and the limit distance is greater than $\lambda/2\pi$, the measurement shall be extrapolated to the limit distance by conservatively presuming that the field strength decreases at a 40 dB/decade of distance rate to the $\lambda/2\pi$ distance, and at a 20 dB/decade of distance rate beyond $\lambda/2\pi$. This shall be accomplished using Equation (2):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(near field)}/d_{(10m)}\} + 20\log\{d_{(30/300m)}/d_{(near field)}\} \quad (2)$$

If the single point measured is at a distance greater than $\lambda/2\pi$, then extrapolation to the limit distance shall be calculated using Equation (3):

$$FS_{(10m)} = FS_{(30/300m)} + 20\log\{d_{(30/300m)}/d_{(10m)}\} \quad (3)$$

If both the single point and the limit distance are equal to or closer to the EUT than $\lambda/2\pi$, then extrapolation to the limit distance shall be calculated using Equation (4):

$$FS_{(10m)} = FS_{(30/300m)} + 40\log\{d_{(30/300m)}/d_{(10m)}\} \quad (4)$$

Remark:

$$d_{near field} = 47.77 / f_{MHz}$$

where f_{MHz} is the frequency of the emission being measured in MHz.

7.2.1 E.U.T. Operation

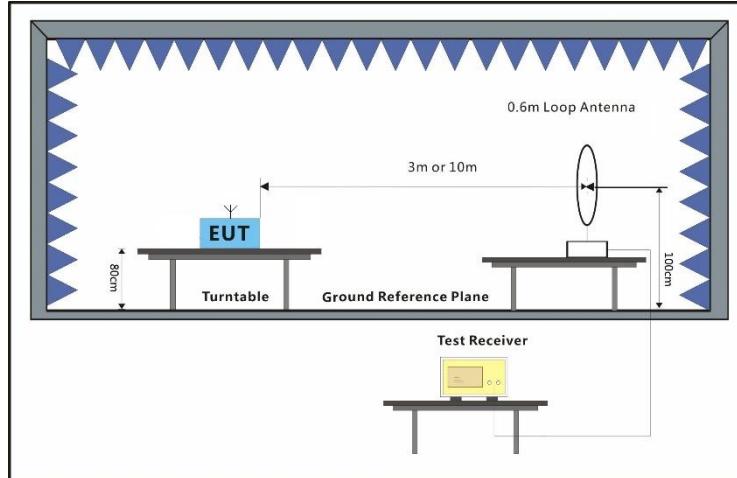
Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

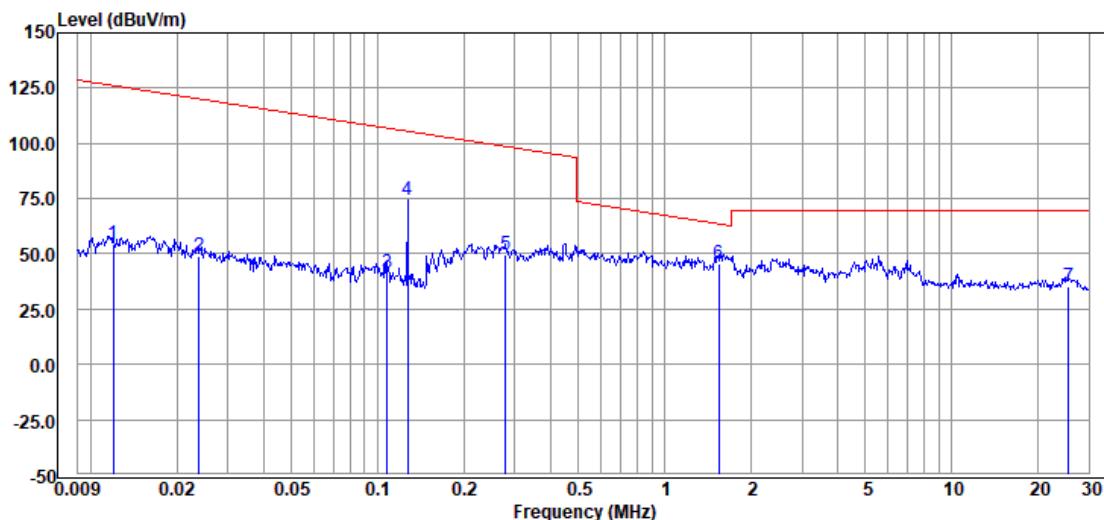
Pre-scan / Final test	Mode Code	Description
Pre-scan	00	Wireless Output (The load shall be set at full load (15W)).
	01	Wireless Output (The load shall be set at half load (7.5W)).
	02	Wireless Output (The load shall be set at empty load (0W)).
Final test	00	Wireless Output (The load shall be set at full load (15W)).

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

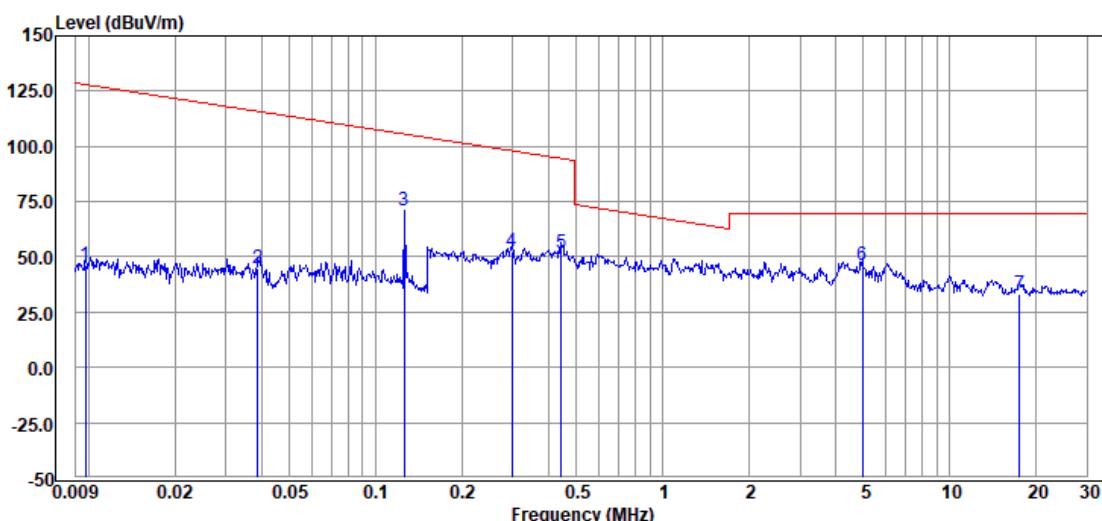
- a. All radiated emission measurements in terms of magnetic field strength shall be performed with a shielded loop antenna.
- b. For all radiated emission measurements in terms of magnetic field strength, the loop antenna were placed such that:
 - i. its centre shall be at 1.3 m height above the ground plane;
 - ii. the projection of its centre onto the ground plane shall be at the specified measurement distance from the projection on the ground plane of the closest point on the boundary of the equipment under test (EUT); and
 - iii. measurements shall be performed with the loop antenna placed vertically, in turn, in two polarizations (the measurement axis specified below is the line segment connecting the projections on the ground plane of the centre of the loop antenna and the centre of the EUT arrangement):
 - coaxial (loop plane perpendicular to the ground plane and to the measurement axis); and
 - coplanar (loop plane perpendicular to the ground plane and coplanar with the measurement axis).

coaxial:

Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level@3m	Result Level@SPEC	Limit Line@SPEC	Over Limit	Detector
(Mark)	(MHz)	(dB μ V)	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.012	34.51	20.10	0.20	54.81	-25.19	46.04	-71.23	QP
2	0.024	28.66	20.10	0.20	48.96	-31.04	40.05	-71.09	QP
3	0.108	21.00	20.10	0.20	41.30	-38.7	26.95	-65.65	QP
4	0.127	54.39	20.10	0.20	74.69	-5.31	25.54	-30.85	Peak
5	0.278	29.49	20.10	0.20	49.79	-30.21	18.71	-48.92	QP
6	1.541	24.89	20.30	0.20	45.39	5.39	23.88	-18.49	QP
7	25.507	14.71	20.10	0.33	35.14	-4.86	29.5	-34.36	QP

Remark: Result Level= Read Level + Antenna Factor + Cable Loss

coplanar:



Item	Freq.	Read Level	Antenna Factor	Cable Loss	Result Level@3m	Result Level@SPEC	Limit Line@SPEC	Over Limit	Detector
(Mark)	(MHz)	(dB μ V)	(dB/m)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.010	26.23	20.10	0.20	46.53	-33.47	47.8	-81.27	QP
2	0.039	24.57	19.90	0.20	44.67	-35.33	35.82	-71.15	QP
3	0.126	50.35	20.10	0.20	70.65	-9.35	25.61	-34.96	Peak
4	0.297	32.10	20.10	0.20	52.40	-27.6	18.15	-45.75	QP
5	0.442	31.12	20.20	0.20	51.52	-28.48	14.7	-43.18	QP
6	4.955	25.49	20.20	0.20	45.89	5.89	29.5	-23.61	QP
7	17.422	12.67	20.04	0.33	33.04	-6.96	29.5	-36.46	QP

Remark: Result Level= Read Level + Antenna Factor + Cable Loss

NOTE:

(1) For test distance other than what is specified, but fulfilling the requirements of section 15.31(f) (2) the field strength is calculated by adding additionally an extrapolation factor of 40dB/decade (inverse linear distance for field strength measurements).

So the Distance Extrapolation Factor in dB is $40 \cdot \log(D_{TEST} / D_{SPEC})$ where D_{TEST} = Test Distance and D_{SPEC} = Specified Distance.

Field strength limit (dB μ V/m)@test distance= Field strength limit (dB μ V/m)@specified distance +Distance Extrapolation Factor

(2) The lower limit shall apply at the transition frequencies.

7.3 Radiated Emissions (30MHz-1GHz)

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2013) Section 6.5

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector.

7.3.1 E.U.T. Operation

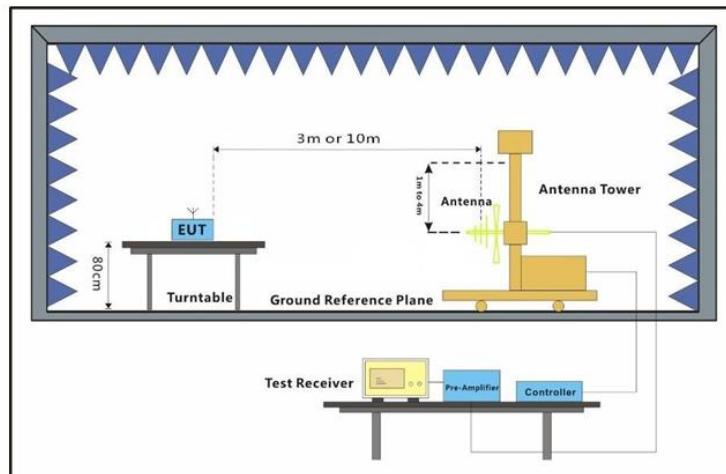
Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	Wireless Output (The load shall be set at full load (15W)).
	01	Wireless Output (The load shall be set at half load (7.5W)).
	02	Wireless Output (The load shall be set at empty load (0W)).
Final test	00	Wireless Output (The load shall be set at full load (15W)).

7.3.3 Test Setup Diagram

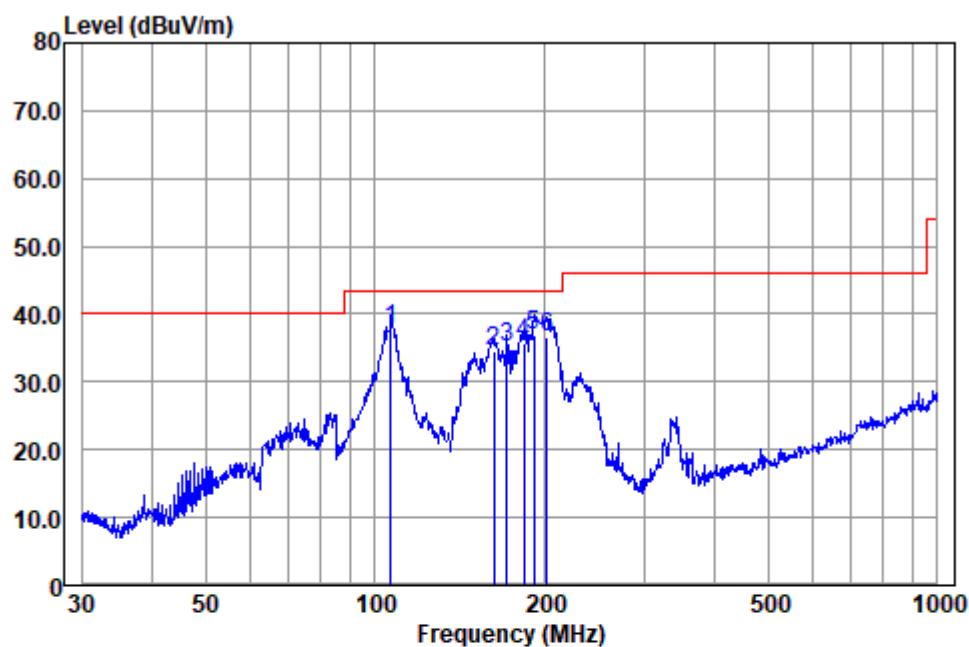


7.3.4 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1GHz at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, And found the X axis positioning which it is worse case.
- i. Repeat above procedures until all frequencies measured was complete.

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

Horizontal:



Antenna Polarity :HORIZONTAL

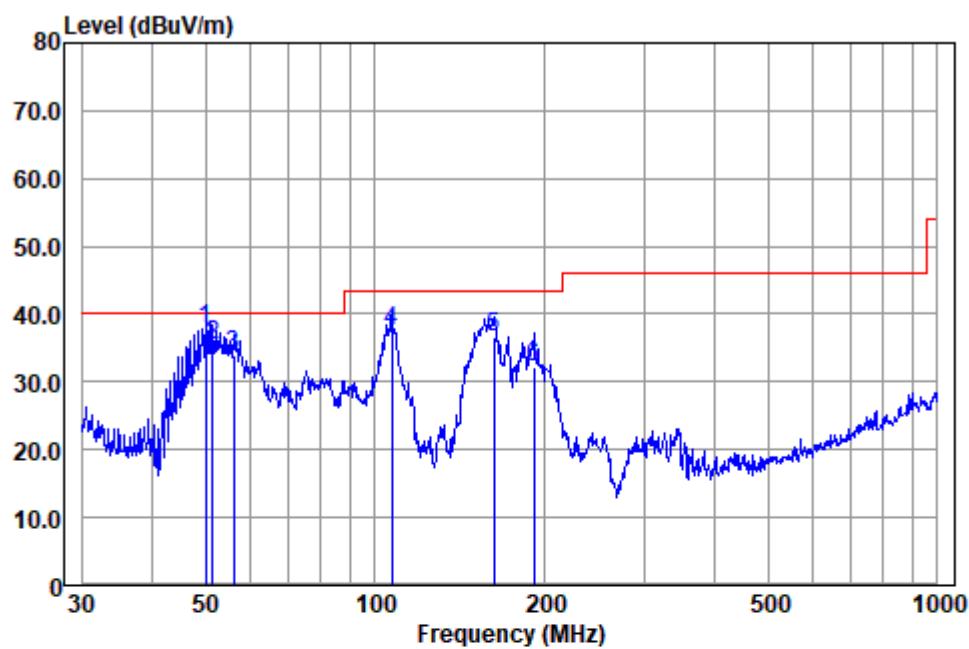
EUT/Project :1323PT

Test mode :00

Freq	Read	Antenna	Cable	Preamp	Emission	Limit	Over	Remark
	Level	Factor	Loss	Factor	Level	Line	Limit	
MHz dBuV dB/m dB dBuV/m dBuV/m dB								
1	106.759	59.38	10.13	1.96	33.58	37.89	43.50	-5.61 QP
2	162.611	51.87	13.45	2.53	33.44	34.41	43.50	-9.09 QP
3	171.393	53.30	12.48	2.61	33.41	34.98	43.50	-8.52 QP
4	183.844	55.54	11.15	2.52	33.35	35.86	43.50	-7.64 QP
5	191.745	56.97	10.48	2.68	33.33	36.80	43.50	-6.70 QP
6	202.100	56.82	9.96	3.05	33.28	36.55	43.50	-6.95 QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss+Preamp Factor

Vertical:



Antenna Polarity : VERTICAL

EUT/Project : 1323PT

Test mode : 00

Freq	Read	Antenna	Cable	Preamp	Emission	Limit	Over	Remark
	Level	Factor	Loss	Factor	Level	Line	Limit	
1	49.881	56.66	13.92	1.02	33.70	37.90	40.00	-2.10 QP
2	51.481	54.07	13.90	1.05	33.68	35.34	40.00	-4.66 QP
3	56.001	52.82	13.60	1.13	33.64	33.91	40.00	-6.09 QP
4	107.134	58.82	10.20	1.97	33.58	37.41	43.50	-6.09 QP
5	162.611	54.11	13.45	2.53	33.44	36.65	43.50	-6.85 QP
6	191.745	52.36	10.48	2.68	33.33	32.19	43.50	-11.31 QP

Note: Emission Level = Read Level + Antenna Factor + Cable loss - Preamp Factor

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SHCR2306001323PT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for SHCR2306001323PT

End of the Report -