

TEST REPORT

Report Number.....:	90146-22-72-22-PP001	
Date of issue.....:	2022.4.18	
Tested by (+signature).....:	Duke Chen	<i>Duke Chen</i>
Approved by (+signature).....:	Jason Gao	<i>Jason gao</i>
Testing Laboratory name.....:	SLG-CPC Testlaboratory Co., Ltd.	
Address.....:	No. 11, Wu Song Road, Dongcheng District, Dongguan, Guangdong Province, China 523117	
Applicant's name.....:	Zhongshan Tianmao Battery Co.,Ltd.	
Address.....:	No. 208, Qianjin one Road, Xin Qianjin Village, Tanzhou Town, Zhongshan City, China	
Manufacturer's name	Zhongshan Tianmao Battery Co.,Ltd.	
Address.....:	No. 208, Qianjin one Road, Xin Qianjin Village, Tanzhou Town, Zhongshan City, China	
Factory's name	Zhongshan Tianmao Battery Co.,Ltd.	
Address.....:	No. 208, Qianjin one Road, Xin Qianjin Village, Tanzhou Town, Zhongshan City, China	
Standard(s).....:	FCC Rules and Regulations Part 15 Subpart C, Section 209	
Test item description.....:	Poweronetek Portable Power Station 600	
Trade Mark.....:	N/A	
Model/Type reference.....:	PSK600;PSK500;TTD600;TTD500;TMB600	
FCC ID.....:	2A6AX-PSK600	
Date of receipt of test item.....:	Feb. 25, 2022	
Date (s) of performance of test:	Feb. 25-Apr. 12, 2022	
Summary of Test Results.....:	Pass	
The Summary of Test Results based on a technical opinion belongs to the standard(s).		
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1. SUMMARY OF TEST RESULTS

EMISSION		
Description of Test Item	Standard & Limits	Results
Conducted Emission	FCC Part 15, Subpart C- Section 15.207 ANSI C63.10-2013	Pass
Radiated Emission	FCC Part 15, Subpart C- Section 15.209 ANSI C63.10-2013	Pass
20dB Bandwidth	FCC Part 15, Subpart C- Section 15.215 ANSI C63.10-2013	Pass
Note: N/A is an abbreviation for Not Applicable.		

2. GENERAL INFORMATION

2.1. Description of Device (EUT)

Product Name	Poweronetek Portable Power Station 600
Trade Name	N/A
Model Name	PSK600;PSK500;TTD600;TTD500;TMB600
Model Differences	PSK600;PSK500;TTD600;TTD500;TMB600; models numbers are said to be identical in same technical construction including circuit diagram,Only the appearance is different.
Series Model	N/A
Operation frequency	115-205KHz
Modulation Type	FSK
Antenna Type	Inductive Loop Antenna with 0dBi
Wireless Charging	15W
Hardware version number	V1.0
Software version number	V1.0
Connecting I/O Port(s)	Please refer to the User's Manual

2.2. Independent Operation Modes

	Mode	TEST MODE DESCRIPTION
	1.	Stand-by mode
	2.	Charging
	3	Wireless Charging
Note: 1. All test modes were pre - tested, but we only recorded the worst case in this report.		

2.3. Description of Test Facility

Site Description

EMC Lab. :

Accredited by ISED, October 04 2021
CAB identifier: CN0126
Company Number: 27767
Accredited by A2LA, October 04 2021
The Certificate Registration Number is 6325.01

Name of Firm : SLG-CPC Testlaboratory Co., Ltd.
Site Location : No. 11, Wu Song Road, Dongcheng District, Dongguan,
Guangdong Province, China 523117

2.4. Description of Support Device

No.	Equipment	Trade name	Model	S/N	Power Cord
1.	/	/	/	/	/
2.					
3.					
4.					

2.5. Measurement Uncertainty

Test Item	Uncertainty
Occupied Channel Bandwidth	: $\pm 2.3\%$
Conducted Emission Uncertainty	: 3.08dB
Radiated Emission Uncertainty (3m Chamber)	: 3.60dB (30M~1GHz) 4.48dB (1~6GHz)

3. MEASURING DEVICE AND TEST EQUIPMENT

3.1. MEASUREMENT EQUIPMENT USED

Equipment	Model	Manufacturer	S/N	Cal. Due
RF Connected Test				
Vector Signal Generator	Rohde & Schwarz	SMBV100B(6G)	101166	2022/07/30
Analog Signal Generator	Rohde & Schwarz	SMB100A(40G)	181333	2022/07/30
Signal Analyzer	Rohde & Schwarz	FSV40	101527	2022/05/24
Power Analyzer	Rohde & Schwarz	OSP-B157W8	N/A	2022/09/23
Wideband Radio Communication Tester	R&S	CMW270	101985	2022/07/30
Temperature&Humidity test chamber	ESPEC	VC 4018	/	2022/04/02
Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	166898	2022/09/07
Radiated Emission Test				
EMI Test Receiver	KEYSIGHT	N9010A	MY56070465	2022/12/10
EMI Test Receiver	Rohde & Schwarz	FSV40	101511	2022/05/24
Bilog Antenna	Schwarzbeck	VULB 9163	01335	2023/04/28
Power Amplifier	EMEC	EM330	060676	2022/12/10
Cable	Tuyue	F4309	L-400-NmNm-12000	2022/12/10
Signal Analyzer	Rohde & Schwarz	FSV40	101511	2022/05/24
Horn Antenna	Schwarzbeck	BBHA9170	/	2022/10/09
Power Amplifier	Rohde & Schwarz	SCU-18F	180118	2022/05/17
Active Loop Antenna	ETS LINDGREN	6512	41623	2022/04/26
Test Software	Farad	EZ-EMC	Ver.CPC-3A1	/
Conducted Emission Test				
LISN	Schwarzbeck	NSLK 8127	8127-892	2022/03/19
EMI Test Receiver	R&S	ESR3	102124	2022/12/10
Pulse Limiter	R&S	ESH3-Z2	357.8810.52	2022/12/10
Test Software	Farad	EZ-EMC	Ver.CPC-3A1	/

4. 20DB BANDWIDTH

4.1. Test Procedure

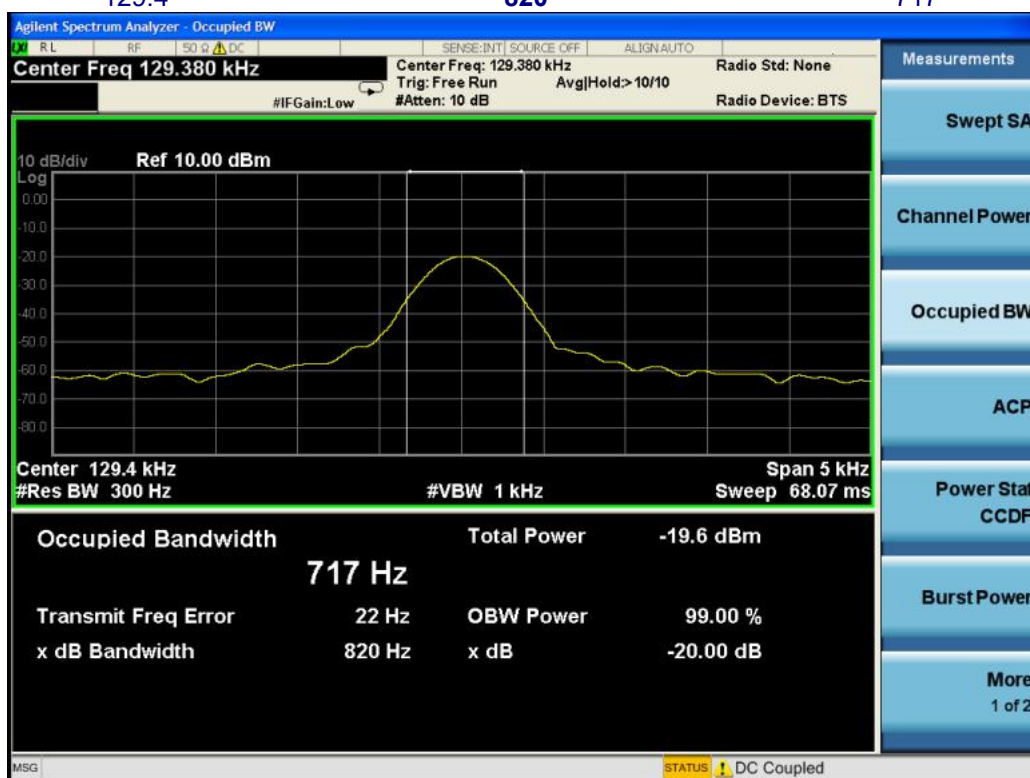
Set to the maximum power setting and enable the EUT transmit continuously

- The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.
 - The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW.
 - Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation.
 - The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target “-xx dB down” requirement
 - Set detection mode to peak and trace mode to max hold.
 - Determine the “-xx dB down amplitude” using [(reference value) – xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.
- Measure and record the results in the test report.

4.2. Test Results

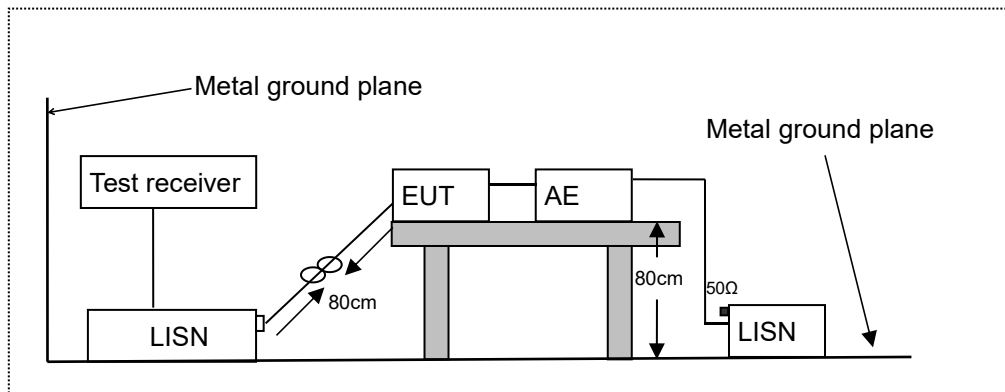
Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measurement bandwidth will always follow the RBW. The RBW is set to 300 Hz to perform the occupied bandwidth test.

Temperature:	24 °C	Test Date:	Apr. 07, 2022
Humidity:	53 %	Test By:	Ken
Frequency	20 dB occupied bandwidth	99% occupied bandwidth	
kHz	Hz	Hz	
129.4	820	717	



5. POWER LINE CONDUCTED EMISSION MEASUREMENT

5.1. Block Diagram of Test Setup



LISN: Line Impedance Stabilization Network

AE: Associated equipment

EUT: Equipment under test

5.2. Limits

FCC Part 15.207

Frequency (MHz)	Limit (dB μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *
0.50 ~ 5.00	56.0	46.0
5.00 ~ 30.00	60.0	50.0

NOTE1-The lower limit shall apply at the transition frequencies.
 NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

5.3. Test Procedure

The EUT was placed on a desk 0.8 m height from the metal ground plane and 0.4 m from the conducting wall of the shielding room and it was kept at least 0.8 m from any other grounded conducting surface. The size of the table will nominally be 1.5 m x1.0 m.

The rear of the arrangement shall be flush with the back of the supporting tabletop unless that would not be possible or typical of normal use.

All units of equipment forming the system under test (includes the EUT as well as connected peripherals and associated equipment or devices) shall be arranged such that a nominal 0.1 m separation is achieved between the neighboring units.

Connect EUT to the power mains through a line impedance stabilization network (LISN). Where the mains cable supplied by the manufacturer is longer than 1 m, the excess should be folded at the centre into a bundle no longer than 0.4 m, so that its length is shortened to 1 m.

All the support units are connecting to the other LISN.

The LISN provides 50 ohm coupling impedance for the measuring instrument.

Both sides of AC line were checked for maximum conducted interference.

The frequency range from 150 kHz to 30 MHz was sweep.

Set the test-receiver system to quasi peak detect function and average detect function, and to measure the conducted emissions values.

Test results were obtained from the following equation:

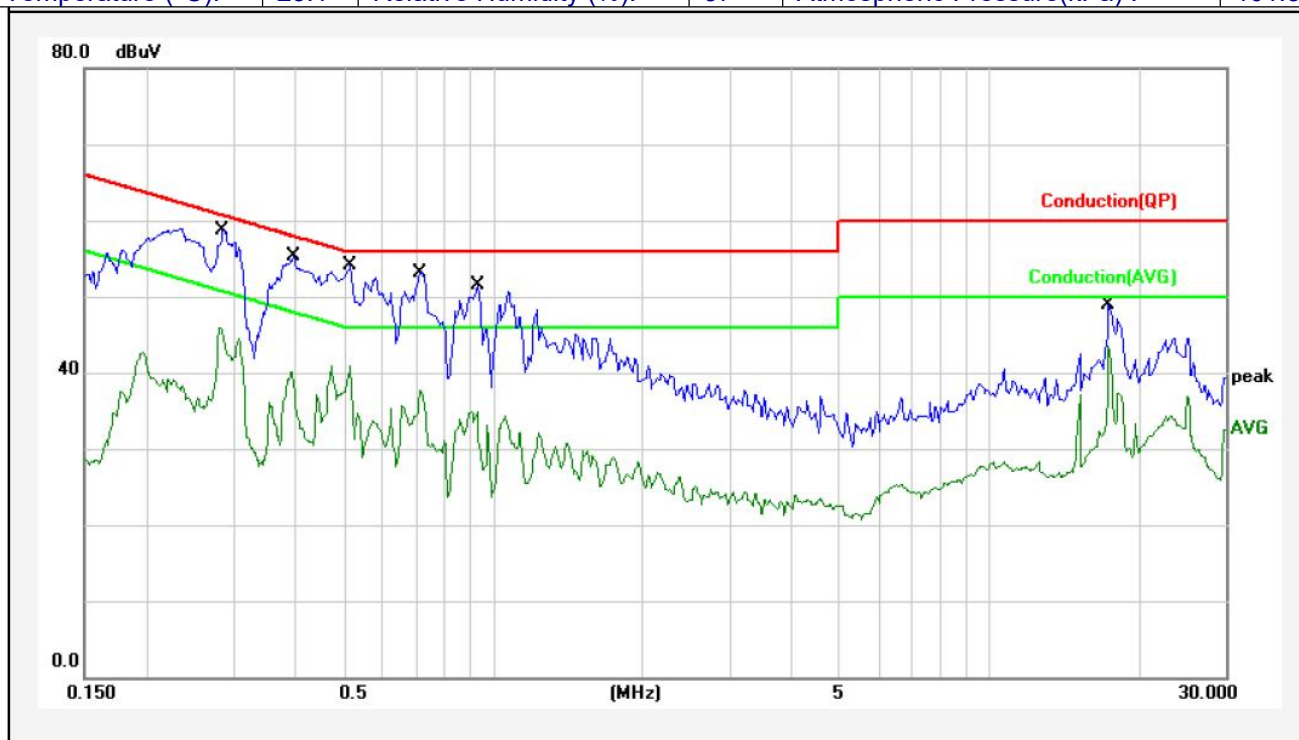
Emission Level (dBμV) = LISN Factor (dB) + Cable Loss (dB) + Reading (dBμV)

Margin (dB) = Emission Level (dBμV) - Limit (dBμV)

5.4. Measuring Results

PASS.

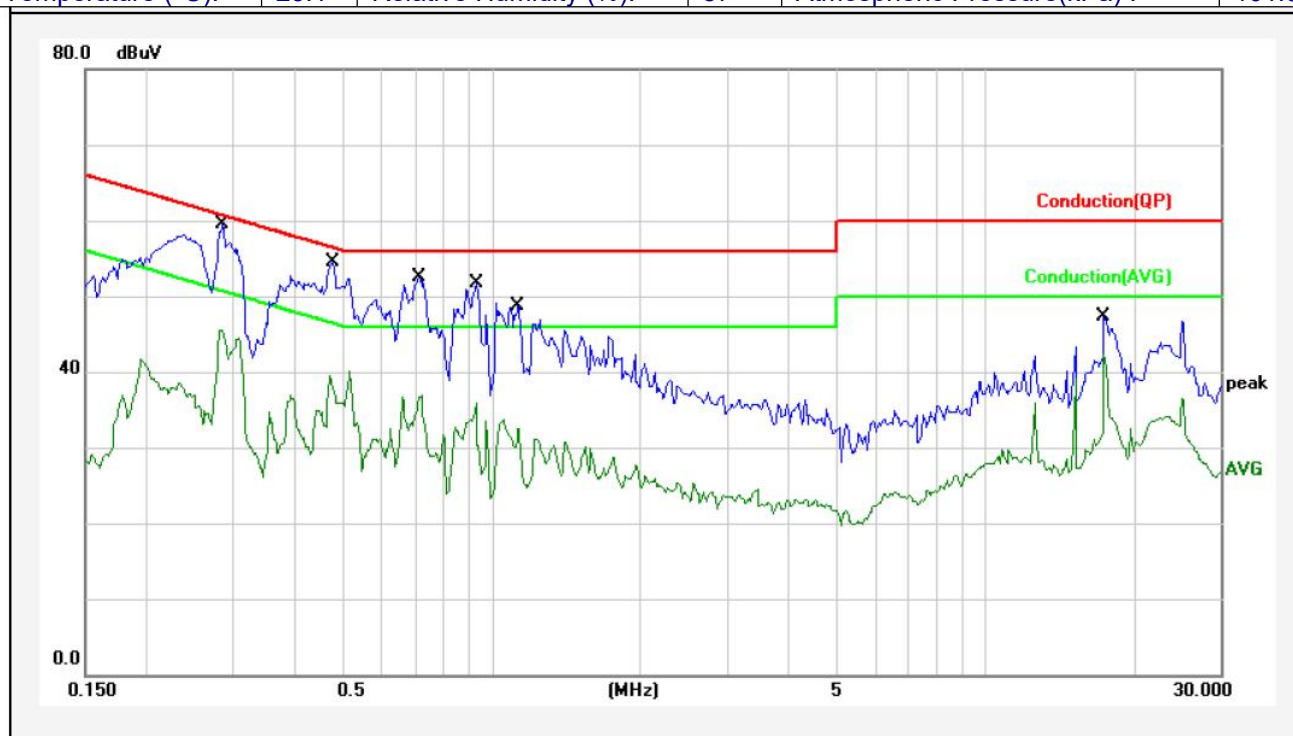
M/N		:	PSK600			
Test Mode		:	Charging			
Test Phase		:	Power Line; Live			
Test Voltage		:	AC 120V/60Hz			
Test Engineer		:	Jerry Hu			
Test Date		:	2022.04.08			
Temperature (°C):	23.1	Relative Humidity (%):	57	Atmospheric Pressure(kPa) :	101.3	



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2860	11.06	44.74	55.80	60.64	-4.84	QP	P	
2	0.2860	11.06	34.83	45.89	50.64	-4.75	AVG	P	
3	0.3964	11.08	41.22	52.30	57.93	-5.63	QP	P	
4	0.3964	11.08	29.07	40.15	47.93	-7.78	AVG	P	
5	0.5157	11.13	39.97	51.10	56.00	-4.90	QP	P	
6	0.5157	11.13	29.71	40.84	46.00	-5.16	AVG	P	
7	0.7150	11.20	38.90	50.10	56.00	-5.90	QP	P	
8	0.7150	11.20	26.41	37.61	46.00	-8.39	AVG	P	
9	0.9301	11.28	37.12	48.40	56.00	-7.60	QP	P	
10	0.9301	11.28	23.60	34.88	46.00	-11.12	AVG	P	
11	17.4541	11.74	34.06	45.80	60.00	-14.20	QP	P	
12	17.4541	11.74	31.79	43.53	50.00	-6.47	AVG	P	

Note: Level=Reading+Factor.
 Margin=Level-Limit.

M/N		:	PSK600			
Test Mode		:	Charging			
Test Phase		:	Power Line; Neutral			
Test Voltage		:	AC 120V/60Hz			
Test Engineer		:	Jerry Hu			
Test Date		:	2022.04.08			
Temperature (°C):	23.1	Relative Humidity (%):	57	Atmospheric Pressure(kPa) :		101.3



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2860	11.05	45.55	56.60	60.64	-4.04	QP	P	
2	0.2860	11.05	34.52	45.57	50.64	-5.07	AVG	P	
3	0.4762	11.13	40.37	51.50	56.41	-4.91	QP	P	
4	0.4762	11.13	28.38	39.51	46.41	-6.90	AVG	P	
5	0.7150	11.20	38.30	49.50	56.00	-6.50	QP	P	
6	0.7150	11.20	25.65	36.85	46.00	-9.15	AVG	P	
7	0.9301	11.28	37.52	48.80	56.00	-7.20	QP	P	
8	0.9301	11.28	24.70	35.98	46.00	-10.02	AVG	P	
9	1.1350	11.31	34.49	45.80	56.00	-10.20	QP	P	
10	1.1350	11.31	22.34	33.65	46.00	-12.35	AVG	P	
11	17.4541	11.84	32.36	44.20	60.00	-15.80	QP	P	
12	17.4541	11.84	30.53	42.37	50.00	-7.63	AVG	P	

Note: Level=Reading+Factor.
 Margin=Level-Limit.

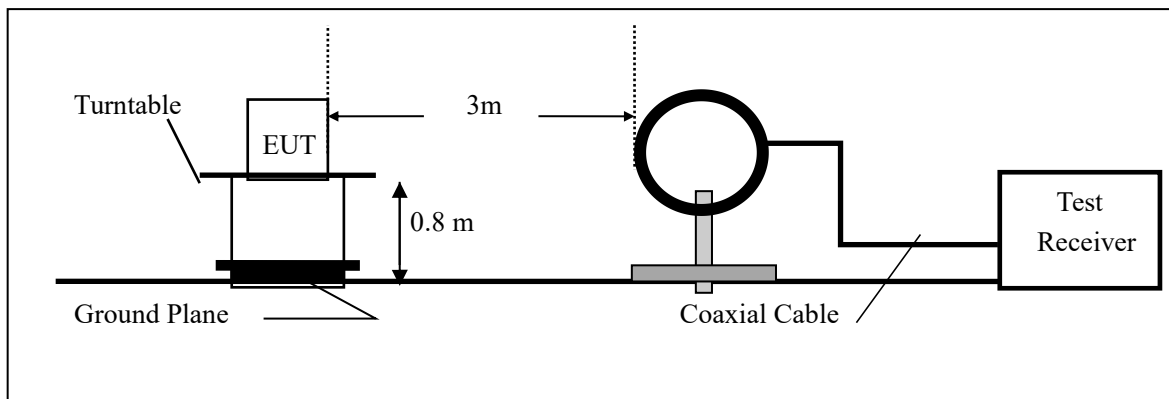
6. RADIATED EMISSION TEST

6.1. Measurement Procedure

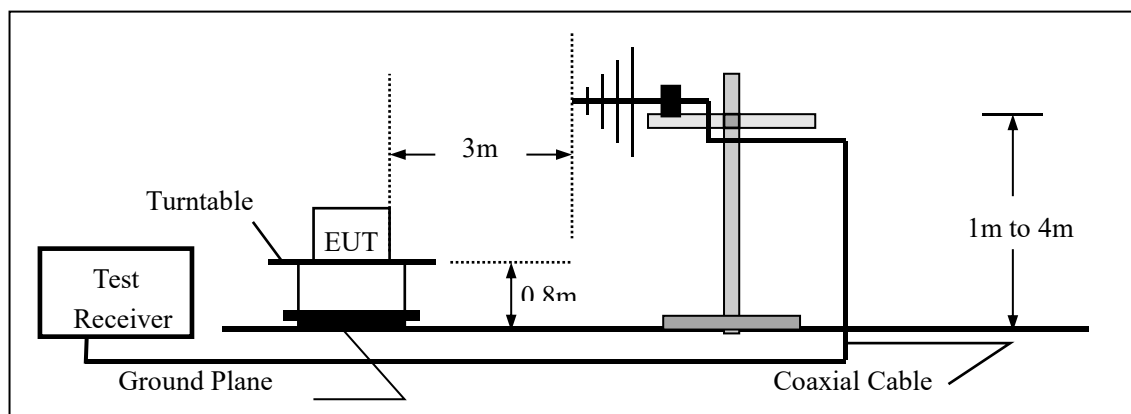
1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measured were complete.
5. Use the following receiver/spectrum analyzer settings:
 Span = wide enough to fully capture the emission being measured
 RBW=200Hz for 9KHz to 150KHz,
 RBW=9kHz for 150KHz to 30MHz,
 RBW=120KHz for 30MHz to 1GHz
 VBW $\geq 3 \times$ RBW
 Sweep = auto
 Detector function = QP
 Trace = max hold

6.2. Test SET-UP (Block Diagram of Configuration)

(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency Below 1000MHz



6.3.Radiated Emission Limit

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

FCC Part 15.209				
Frequency (MHz)	Field Strength Limitation		Field Strength Limitation Frequency tion at 3m Measurement Dist	
	(uV/m)	Dist	(uV/m)	(dBuV/m)
0.009 – 0.490	2400 / F(KHz)	300m	10000 * 2400/F(KHz)	20log 2400/F(KHz) + 80
0.490 – 1.705	24000 / F(KHz)	30m	100 * 24000/F(KHz)	20log 24000/F(KHz) + 40
1.705 – 30.00	30	30m	100* 30	20log 30 + 40
30.0 – 88.0	100	3m	100	20log 100
88.0 – 216.0	150	3m	150	20log 150
216.0 – 960.0	200	3m	200	20log 200
Above 960.0	500	3m	500	20log 500

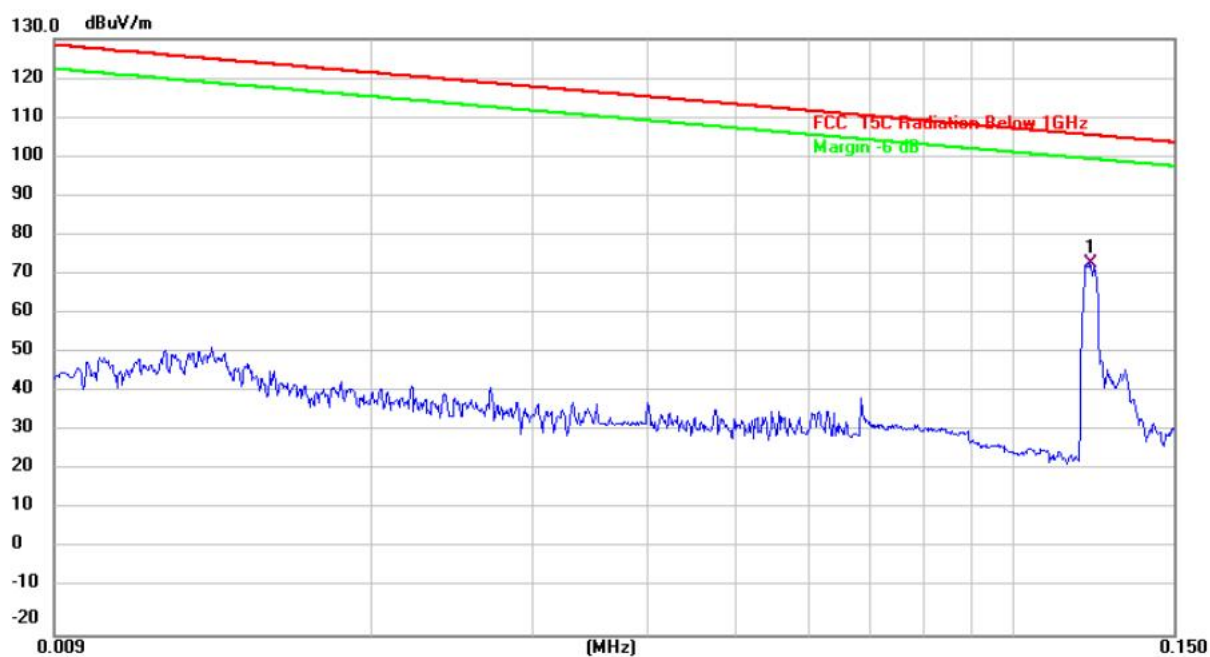
15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

- Remark:
1. Emission level in dBuV/m=20 log (uV/m)
 2. Measurement was performed at an antenna to the closed point of EUT distance of meters.
 3. Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of § 15.205, and the emissions located in restricted bands also comply with 15.209 limit.

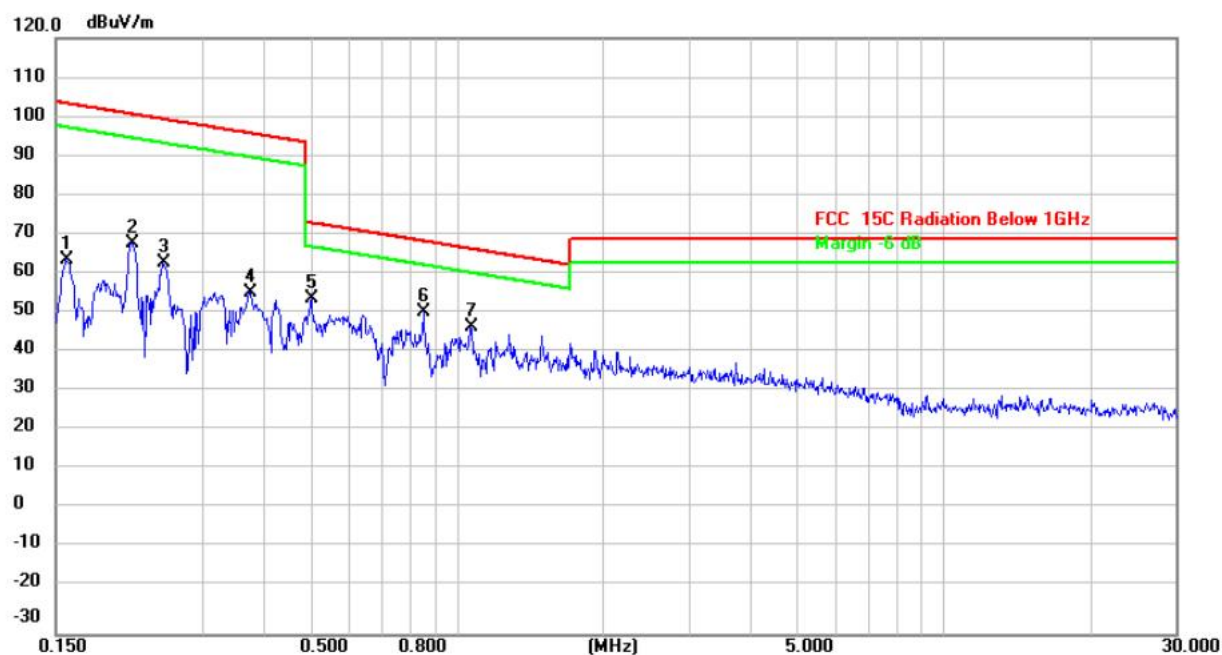
6.4.Measurement Result

9kHz-150kHz:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	0.1215	52.98	20.44	73.42	105.8	-32.42	QP

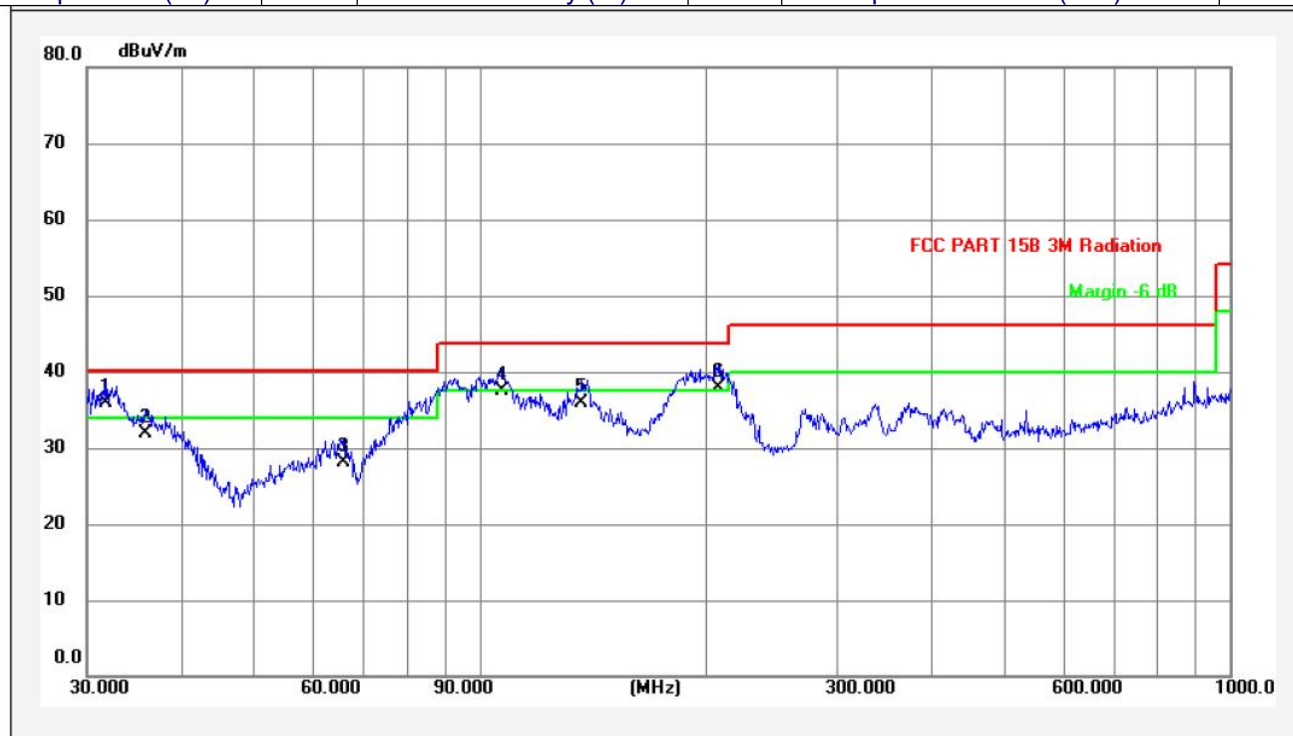
150kHz-30MHz:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Over dB	Detector
1		0.1573	43.63	20.50	64.13	103.6	-39.48	QP
2		0.2150	47.95	20.52	68.47	100.9	-32.45	QP
3		0.2481	43.07	20.53	63.60	99.68	-36.08	QP
4		0.3751	35.66	20.56	56.22	96.11	-39.89	QP
5		0.5020	33.94	20.60	54.54	73.59	-19.05	QP
6	*	0.8527	30.27	20.74	51.01	69.00	-17.99	QP
7		1.0653	26.46	20.80	47.26	67.07	-19.81	QP

30MHz-1GHz:

M/N	:	PSK600				
Test Mode	:	Wireless Charging				
Test Phase	:	Vertical				
Test Voltage	:	AC 120V/60Hz				
Test Engineer	:	Jerry Hu				
Test Date	:	2022.04.08				
Temperature (°C):	24.5	Relative Humidity (%):	51	Atmospheric Pressure(kPa):	101.6	



No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector	MK.	Remark
1	31.7312	11.57	24.43	36.00	40.00	-4.00	QP	*	
2	35.8746	11.99	20.01	32.00	40.00	-8.00	QP		
3	65.8028	10.80	17.40	28.20	40.00	-11.80	QP		
4	107.1337	12.55	25.05	37.60	43.50	-5.90	QP	!	
5	136.9388	9.96	26.04	36.00	43.50	-7.50	QP		
6	208.5800	11.40	26.50	37.90	43.50	-5.60	QP	!	

Note: Level=Reading+Factor.
 Margin=Level-Limit.

M/N	:	PSK600						
Test Mode	:	Wireless Charging						
Test Phase	:	Horizontal						
Test Voltage	:	AC 120V/60Hz						
Test Engineer	:	Jerry Hu						
Test Date	:	2022.04.08						
Temperature (°C):	24.5	Relative Humidity (%):	51	Atmospheric Pressure(kPa):	101.6			



No.	Frequency (MHz)	Factor (dBuV/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Over (dB)	Detector	MK.	Remark
1	89.5899	11.30	24.80	36.10	43.50	-7.40	QP		
2	107.1337	12.55	22.85	35.40	43.50	-8.10	QP		
3	130.3788	10.53	25.17	35.70	43.50	-7.80	QP		
4	182.5592	10.21	29.39	39.60	43.50	-3.90	QP	*	
5	215.2676	11.74	24.56	36.30	43.50	-7.20	QP		
6	51.8430	13.31	8.19	21.50	40.00	-18.50	QP		

Note: Level=Reading+Factor.

Margin=Level-Limit.

-----The end-----