



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

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Report No.: SZEM181000928801
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TEST REPORT

Application No.: SZEM1810009288CR
Applicant: Chug, Inc.
Address of Applicant: 7157 Shady Oak Road Eden Prairie Washington Minnesota 55344 United States
Manufacturer: Shenzhen Rihuida Electronic Co., Ltd
Address of Manufacturer: Building A4, 2nd/3rd/4th floor of building A3, in Fuzhong Industrial Area Xiashiwei Road of Fuyong Street, Bao'an District, Shenzhen
Factory: Shenzhen Rihuida Electronic Co., Ltd
Address of Factory: Building A4, 2nd/3rd/4th floor of building A3, in Fuzhong Industrial Area Xiashiwei Road of Fuyong Street, Bao'an District, Shenzhen
Equipment Under Test (EUT):
EUT Name: QI charger 5w
Model No.: PW001, QIC32, QIC29 ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade mark: Heyday
FCC ID: 2AO23QIC32
Standard(s) : 47 CFR Part 15, Subpart C
Date of Receipt: 2018-10-26
Date of Test: 2018-10-26 to 2018-11-02
Date of Issue: 2018-11-08

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



Keny Xu
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

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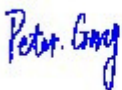


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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-11-08		Original

Authorized for issue by:				
				
		Peter Geng /Project Engineer		
				
		Eric Fu /Reviewer		



2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Antenna Requirement	47 CFR Part 15, Subpart C	N/A	47 CFR Part 15, Subpart C 15.203	Pass
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Emissions (9kHz-1GHz)	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 6.4,6.5,6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Restricted Bands	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.205	Pass
20% Bandwidth	47 CFR Part 15, Subpart C	ANSI C63.10 (2013) Section 7.8.7	47 CFR Part 15, Subpart C 15.215	Pass

Declaration of EUT Family Grouping:

Model No.: PW001, QIC32, QIC29

Only the model QIC32 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on color and model No..



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4 General Information

4.1 Details of E.U.T.

Power supply:	Input: DC 5V/2A Output: 5W
Operation frequency:	110.42-175.00 kHz
Modulation type:	Load modulation
Cable:	USB charging line: 20cm, unshielded
Antenna type:	Inductive Loop Coil Antenna
Remark:	This device has been tested the worst status of full load and the device has been tested with mobile phone at zero charge, intermediate charge, and full charge.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Adapter	Apple	A1357 W010A051	REF. No.SEA0500
iPhone 8	Apple	A1863	F4GVQ656JC6D
Micro USB Cable	PHILIPS	SWR2101	REF. No.SEA0700

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.75\text{dB}$
5	RF power density	$\pm 2.84\text{dB}$
6	Conducted Spurious emissions	$\pm 0.75\text{dB}$
7	RF Radiated power	$\pm 4.5\text{dB}$ (below 1GHz)
		$\pm 4.8\text{dB}$ (above 1GHz)
8	Radiated Spurious emission test	$\pm 4.5\text{dB}$ (Below 1GHz)
		$\pm 4.8\text{dB}$ (Above 1GHz)
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1.5\%$
12	Time	$\pm 3\%$



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, 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:

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **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**

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. 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: CN1178**

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

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **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



5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2017-05-10	2020-05-09
Measurement Software	AUDIX	e3 V5.4.1221d	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2018-07-12	2019-07-11
LISN	Rohde & Schwarz	ENV216	SEM007-01	2018-09-25	2019-09-24
LISN	ETS-LINDGREN	3816/2	SEM007-02	2018-04-02	2019-04-01
EMI Test Receiver	Rohde & Schwarz	ESCI	SEM004-02	2018-04-02	2019-04-01

20dB Bandwidth/Restricted bands					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2018-09-25	2019-09-24
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2018-09-27	2019-09-26
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-02	2018-07-12	2019-07-11
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2018-09-27	2019-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2018-09-25	2019-09-24

Radiated emission(below 30MHz)					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM029-01	2018-07-12	2019-07-11
EMI Test Receiver (9kHz-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2018-04-02	2019-04-01
Trilog-Broadband Antenna (30MHz-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-01-26	2019-01-25
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2018-04-13	2019-04-12
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21



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Radiated emission(30MHz-1GHz)					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04
MXE EMI Receiver (20Hz-8.4GHz)	Agilent Technologies	N9038A	SEM004-05	2018-09-25	2019-09-24
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2018-04-02	2019-04-01
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2018-07-12	2019-07-11

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2018-09-27	2019-09-26
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2018-09-27	2019-09-26
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2018-09-27	2019-09-26
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

15.203 requirement:

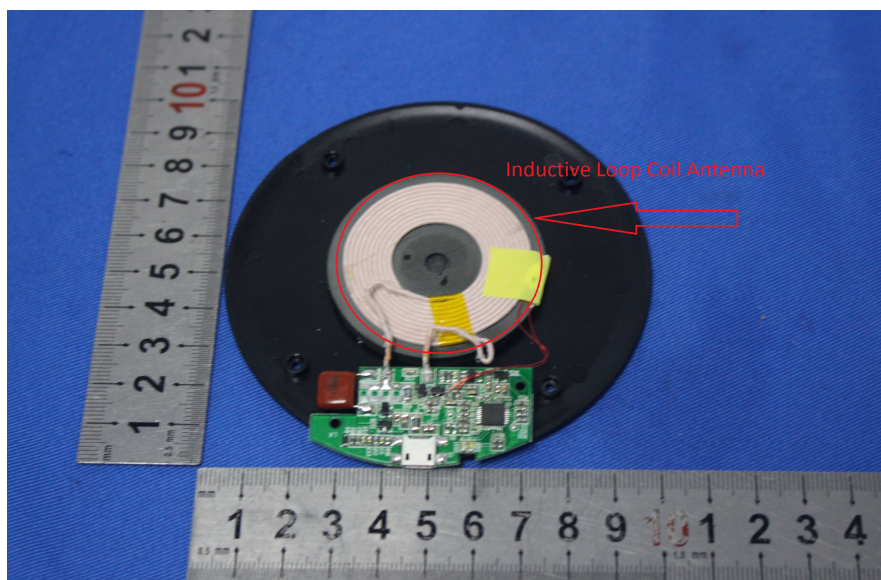
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

6.1.2 Conclusion

Standard 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 integrated on the main PCB and no consideration of replacement.

7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207
Test Method: ANSI C63.10 (2013) Section 6.2
Limit:

Frequency range (MHz)	Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

7.1.1 E.U.T. Operation

Operating Environment:

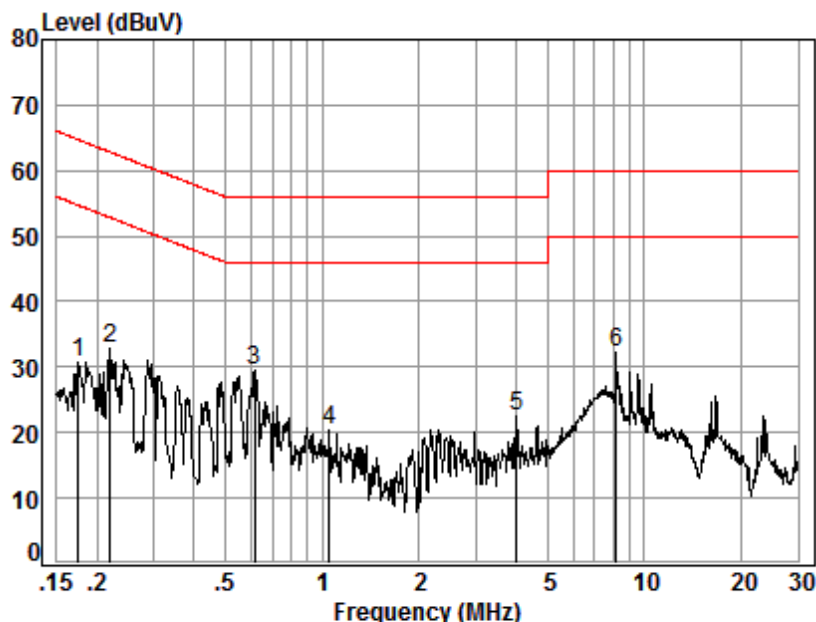
Temperature: 21.5 °C Humidity: 52.2 % RH Atmospheric Pressure: 1010 mbar
Test mode a:Charge mode_Keep the EUT charging(5W)

7.1.2 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane,
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

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

Mode:a; Line:Live Line



Site : Shielding Room

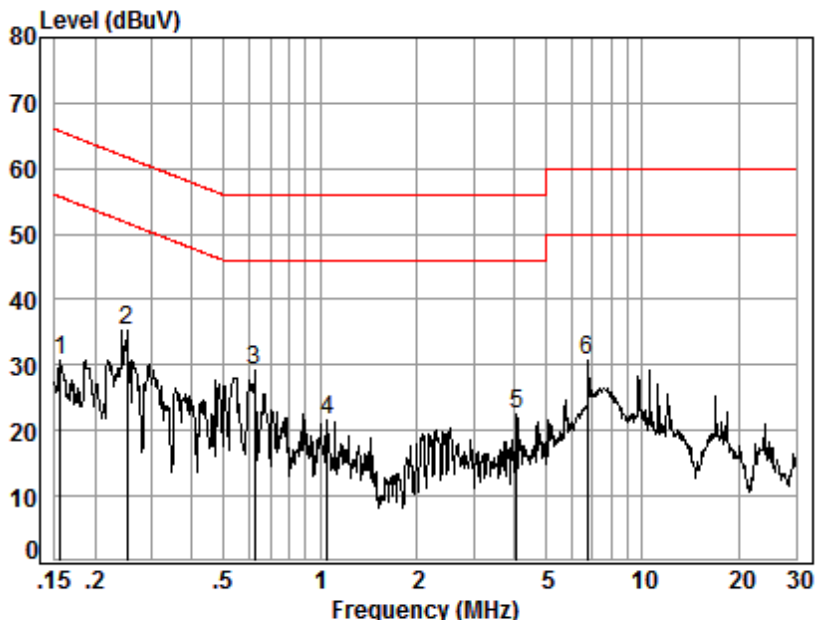
Condition: Line

Job No. : 09288CR

Test mode: a

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.17	0.02	9.66	21.13	30.81	54.72	-23.91	Peak
2	0.22	0.03	9.66	23.15	32.84	52.83	-19.99	Peak
3	0.62	0.07	9.67	19.62	29.36	46.00	-16.64	Peak
4	1.05	0.09	9.74	10.40	20.23	46.00	-25.77	Peak
5	4.01	0.16	9.72	12.61	22.49	46.00	-23.51	Peak
6	8.15	0.17	9.81	22.39	32.37	50.00	-17.63	Peak

Mode:a; Line:Neutral Line



Site : Shielding Room

Condition: Neutral

Job No. : 09288CR

Test mode: a

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.16	0.01	9.63	21.05	30.69	55.69	-25.00	Peak
2	0.25	0.03	9.64	25.60	35.27	51.73	-16.46	Peak
3	0.63	0.07	9.64	19.50	29.21	46.00	-16.79	Peak
4	1.05	0.09	9.71	11.93	21.73	46.00	-24.27	Peak
5	4.07	0.16	9.69	12.67	22.52	46.00	-23.48	Peak
6	6.77	0.17	9.76	20.73	30.66	50.00	-19.34	Peak

7.2 20dB Bandwidth and Restricted Bands

Test Requirement 47 CFR Part 15, Subpart C 15.215
Test Method: ANSI C63.10 (2013) Section 7.8.7
Limit: N/A

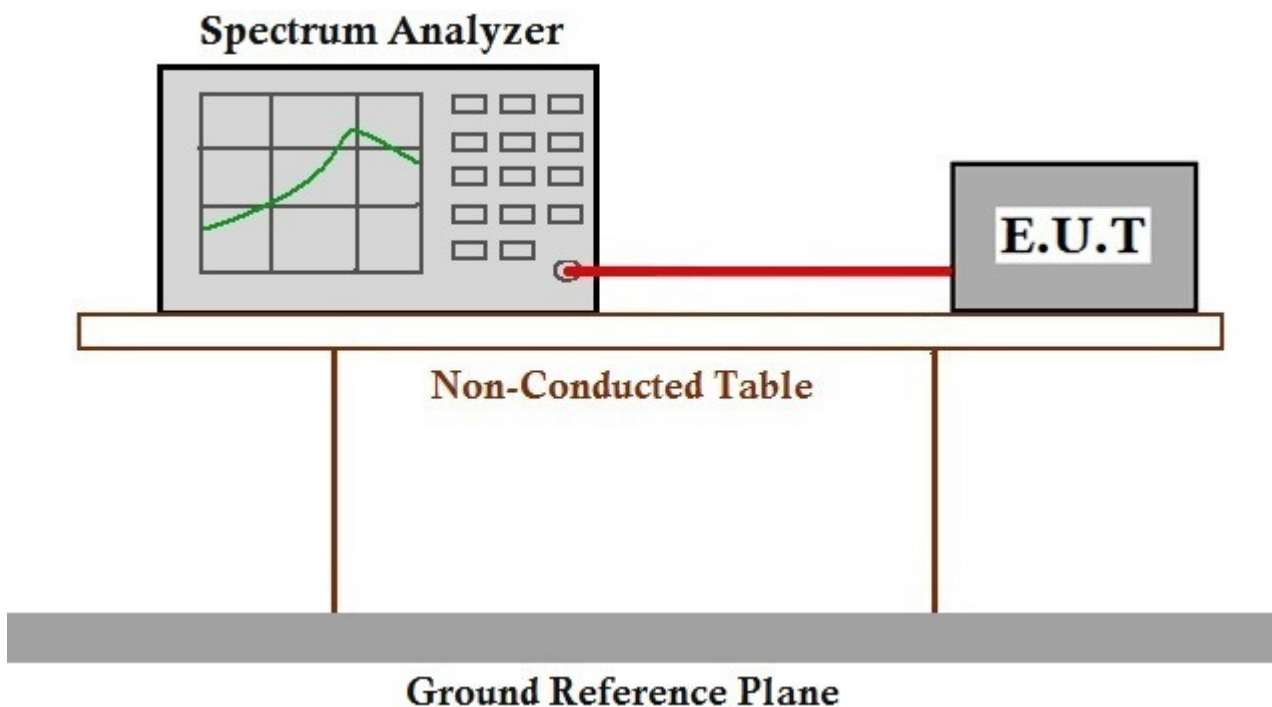
7.2.1 E.U.T. Operation

Operating Environment:

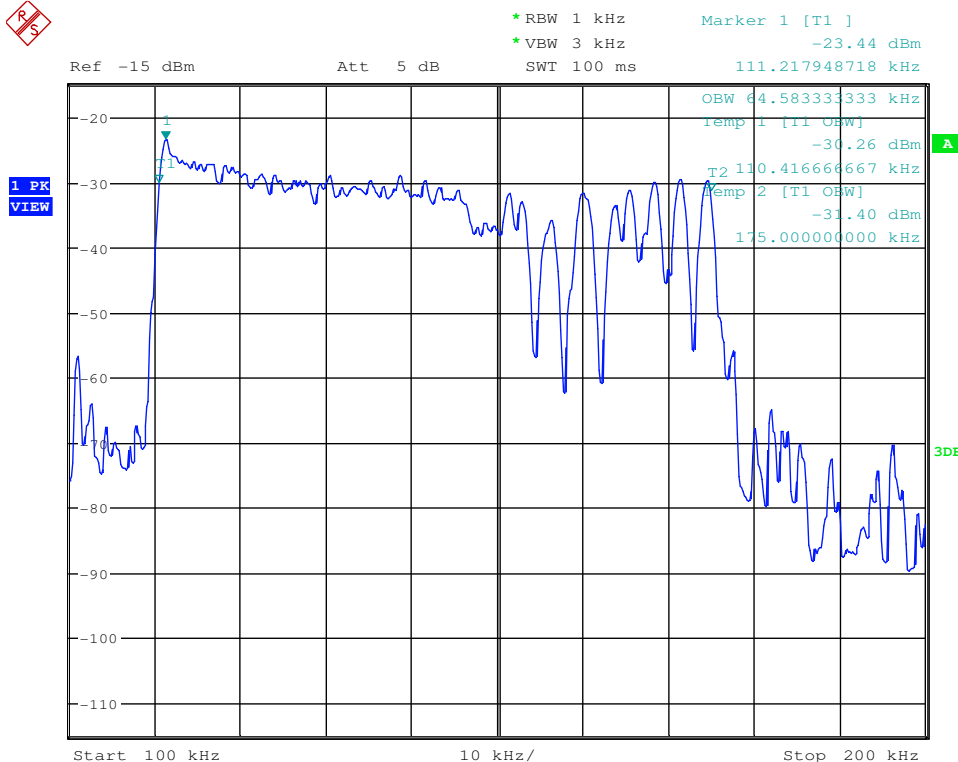
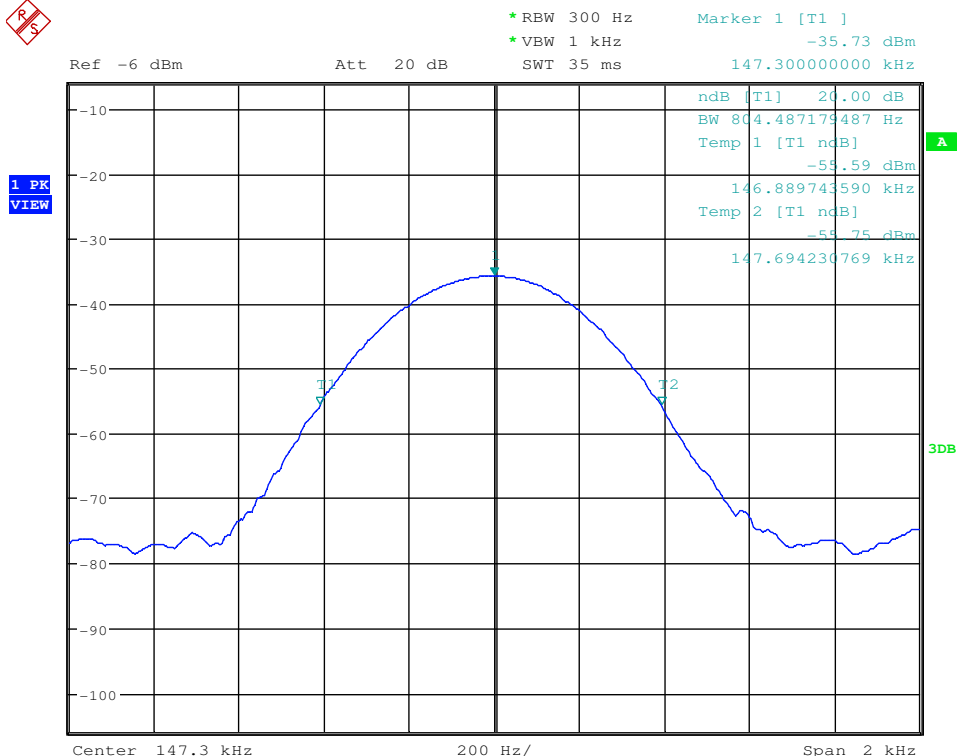
Temperature: 24.2 °C Humidity: 44.7 % RH Atmospheric Pressure: 1015 mbar

Test mode a:Charge mode_Keep the EUT charging(5W)

7.2.2 Test Setup Diagram



7.2.3 Measurement Procedure and Data





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 6.4,6.5,6.6

Frequency Range: 9kHz to 1GHz

Measurement Distance: 3m and 10m

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

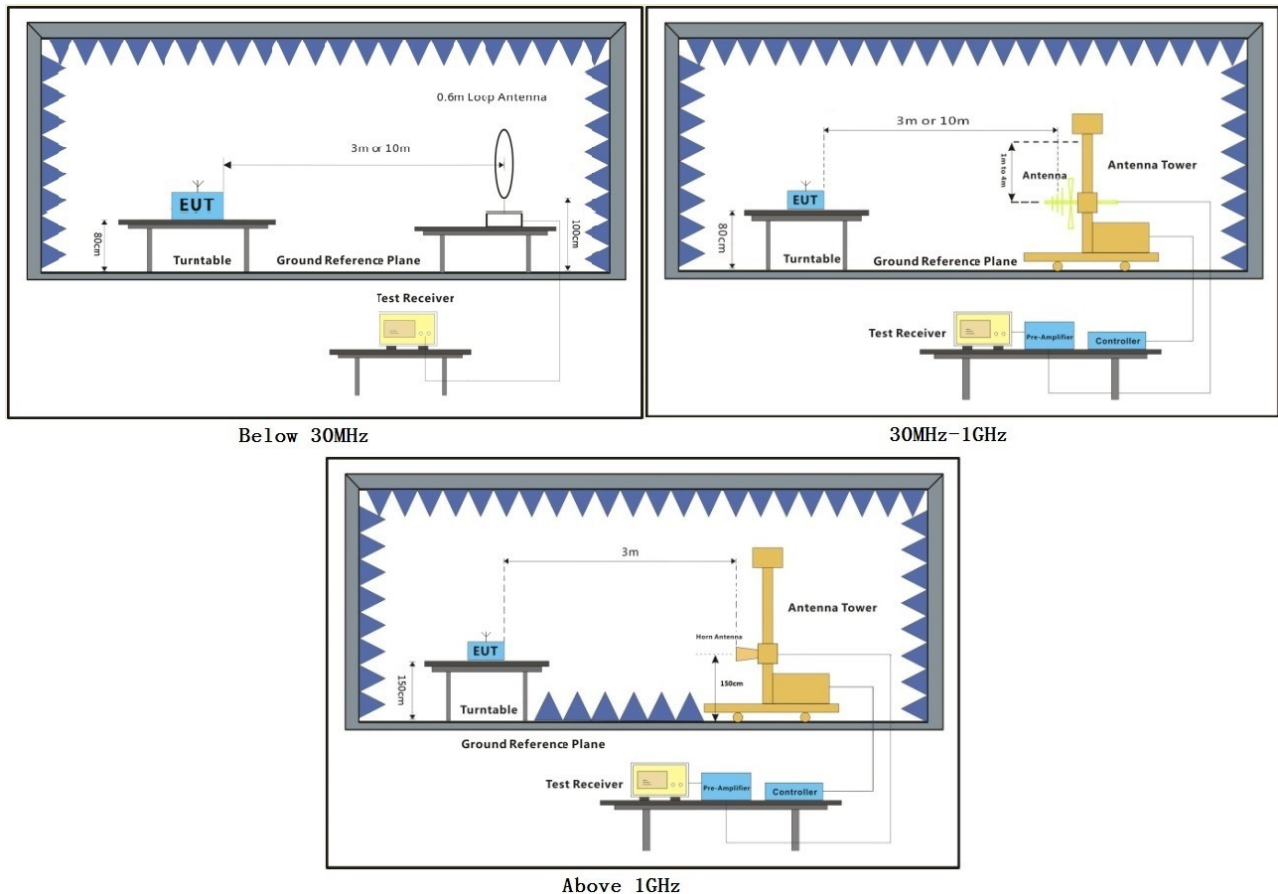
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.9 °C Humidity: 60.4 % RH Atmospheric Pressure: 1015 mbar
Test mode a:Charge mode_Keep the EUT charging(5W)

7.3.2 Test Setup Diagram

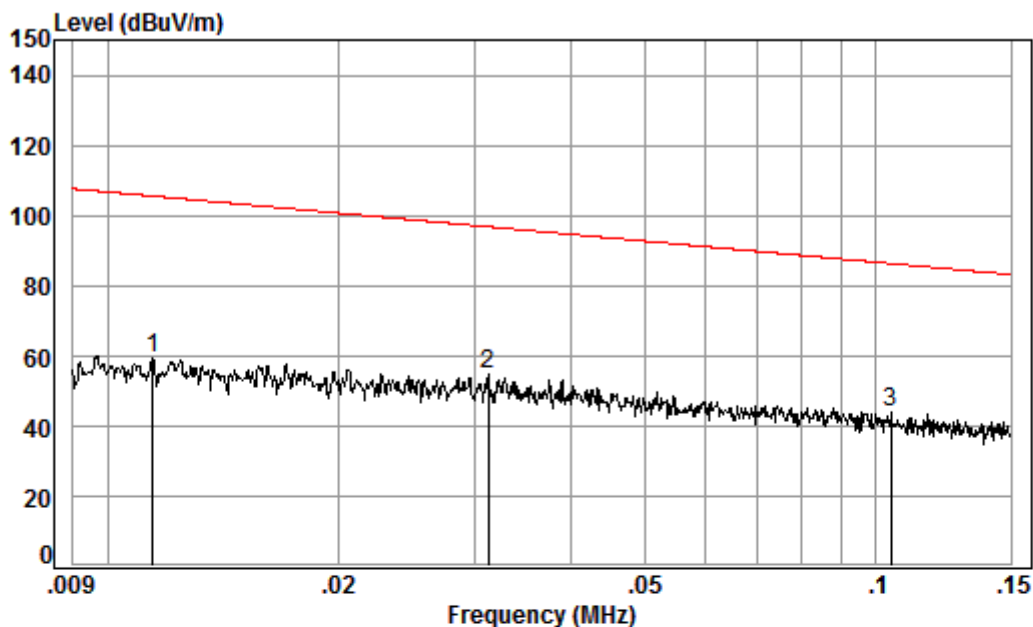


7.3.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.



Mode: a; 0.009-0.15MHz



Condition: 10m

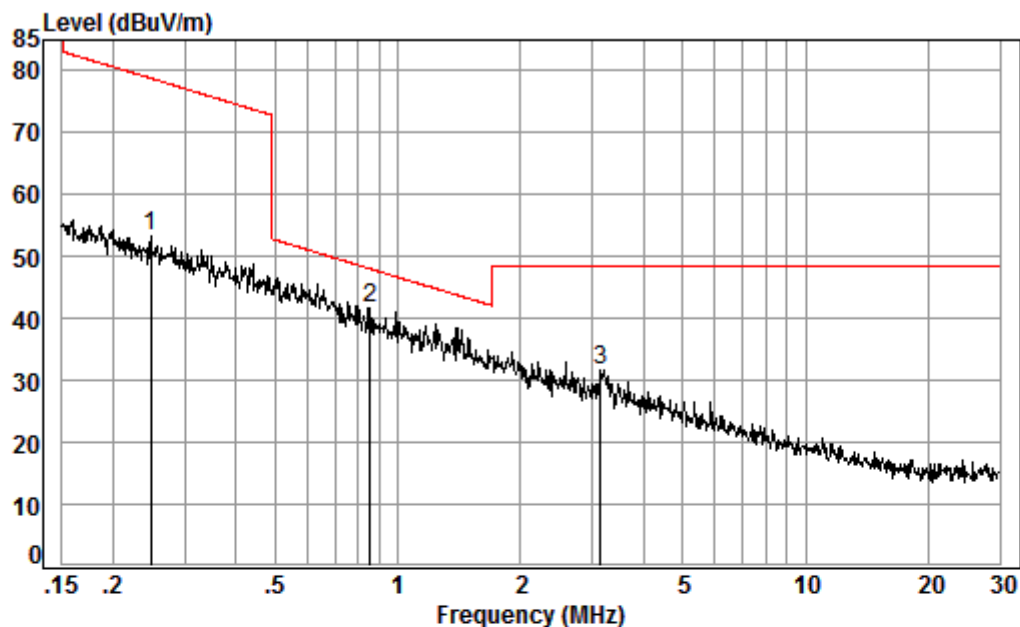
Job No. : 09288CR

Test Mode: a

	Freq	Cable	Ant	Preamp	Read		Limit	Over
		Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	0.01	0.28	18.47	32.55	73.19	59.39	105.52	-46.13
2 pp	0.03	0.17	13.73	32.56	73.52	54.86	96.78	-41.92
3	0.10	0.05	11.97	32.56	64.70	44.16	86.30	-42.14



Mode: a; 0.15-30MHz



Condition: 10m

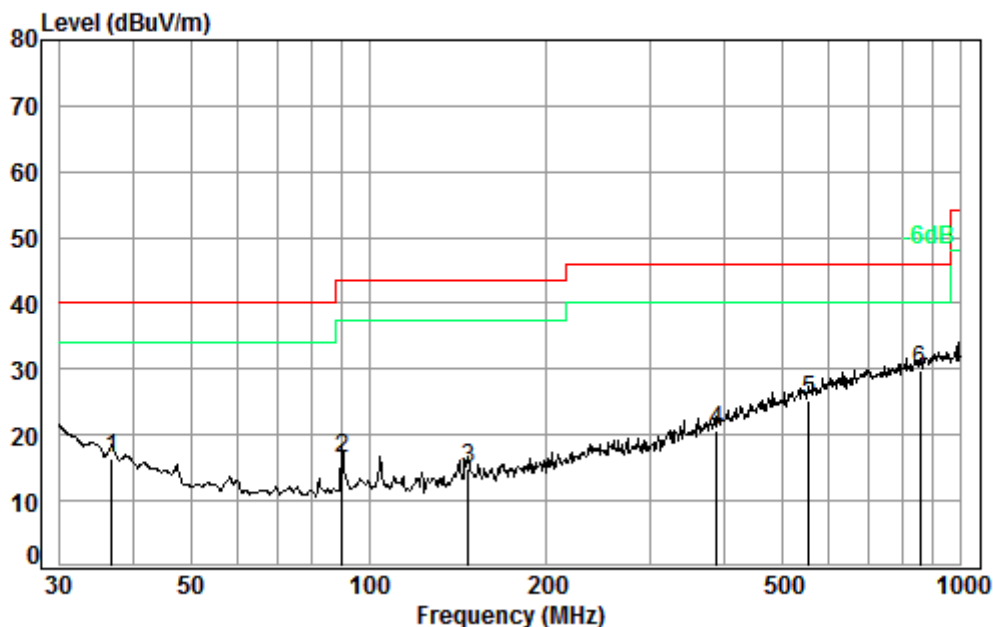
Job No. : 09288CR

Test Mode: a

	Freq	Cable	Ant	Preamp	Read		Limit	Over
	MHz	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	0.25	0.08	12.00	32.56	73.67	53.19	78.80	-25.61
2 pp	0.86	0.20	12.00	32.56	62.15	41.79	48.03	-6.24
3	3.14	0.38	12.18	32.54	51.79	31.81	48.63	-16.82



Mode:a; Polarization:Horizontal;



Condition: 3m HORIZONTAL

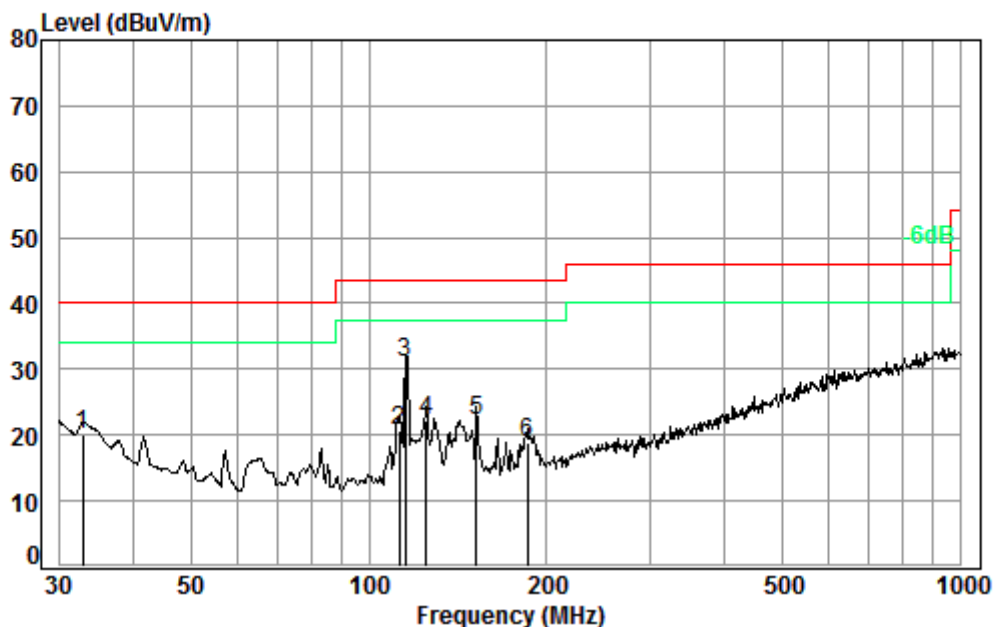
Job No. : 09288CR

Test mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	36.77	0.60	18.97	27.64	24.60	16.53	40.00	-23.47
2	90.22	1.10	13.12	27.51	29.76	16.47	43.50	-27.03
3	147.40	1.31	14.39	27.52	26.64	14.82	43.50	-28.68
4	386.63	2.16	22.07	27.71	24.24	20.76	46.00	-25.24
5	554.83	2.66	25.74	27.78	24.74	25.36	46.00	-20.64
6 pp	854.02	3.42	29.22	27.23	24.37	29.78	46.00	-16.22



Mode:a; Polarization:Vertical;



Condition: 3m VERTICAL

Job No. : 09288CR

Test mode: a

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit	Over
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	32.86	0.60	20.92	27.66	26.17	20.03	40.00	-19.97
2	112.52	1.23	13.42	27.51	33.69	20.83	43.50	-22.67
3 pp	115.32	1.24	13.30	27.51	44.13	31.16	43.50	-12.34
4	125.01	1.26	13.26	27.52	35.30	22.30	43.50	-21.20
5	152.13	1.32	14.82	27.52	33.57	22.19	43.50	-21.31
6	185.14	1.38	16.06	27.53	29.01	18.92	43.50	-24.58



8 Photographs

8.1 Test Setup

Refer to Setup Photos

8.2 EUT Constructional Details (EUT Photos)

Refer to EUT external and internal photos

- End of the Report -