



**FCC 47 CFR PART 15 SUBPART C
TEST REPORT**

FOR

Gigastone Wireless Charger

Model : GA-9100B

Issued to

Gigastone Corporation
12F., No.480, Ruiguang Rd., Neihu Dist., Taipei City 11492, Taiwan

Issued by
WH Technology Corp.



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1. GENERAL INFORMATION

Applicant : Gigastone Corporation
Address : 12F., No.480, Ruiguang Rd., Neihu Dist., Taipei City 11492, Taiwan
Manufacturer/ Factory : Gigastone Corporation
Address : 12F., No.480, Ruiguang Rd., Neihu Dist., Taipei City 11492, Taiwan
EUT : Gigastone Wireless Charger
Model Name : GA-9100B
Trade Name : Gigastone
Model Differences : N/A

Is here with confirmed to comply with the requirements set out in the FCC Rules and Regulations Part 15 Subpart C and the measurement procedures were according to ANSI C63.10-2013. The said equipment in the configuration described in this report shows the maximum emission levels emanating

FCC part 15 Subpart C

Receipt Date : 09/11/2018

Final Test Date :10/25/2018

Tested By:

Oct 25, 2018

(Date)

Bing Chang/ Engineer

Oct 25, 2018

(Date)

Reviewed by:

Bell Wei / Manager

Designation Number: TW2954



2. REPORT OF MEASUREMENTS AND EXAMINATIONS

2.1 LIST OF MEASUREMENTS AND EXAMINATIONS

FCC Rule	Item	Result
15.207	Conducted Emission	PASS
15.205 15.209	Radiated Emission	PASS
15.203	Antenna Requirement	PASS



3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

3.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name	:	Gigastone Wireless Charger
Model Number	:	GA-9100B
FCC ID	:	PLE-GA-9100B
Input Voltage	:	DC 5V/2A; DC9V/2A
Output	:	10W Max
Operate Frequency	:	110KHz-205KHz
Antenna Type	:	Loop Antenna
Antenna gain	:	0dBi

3.3 TEST MODE AND TEST SOFTWARE

- a. During testing, the interface cables and equipment positions were varied according to ANSI C63.10-2013.
- b. The complete test system included Notebook and EUT for RF test.
- c. only the worst case was recorded in this report



3.4 TEST METHODOLOGY & GENERAL TEST PROCEDURES

All testing as described bellowed were performed in accordance with ANSI C63.10:2013 and FCC CFR 47 Part 15 Subpart C .

Conducted Emissions

The EUT is placed on a wood table, which is at 0.8 m above ground plane acceding to clause 15.207 and requirements of ANSI C63.10:2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz are using CISPR Quasi-Peak / Average detectors.

Radiated Emissions

The EUT is a placed on a turn table, which is 0.8 m above ground plane. The turntable was rotated through 360 degrees to determine the position of maximum emission level. The EUT is placed at 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. Each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

- 1)Putting the EUT on the platform and turning on the EUT (on/off button on the bottom of the EUT).
- 2)Setting test channel described as “Channel setting and operating condition” , and testing channel by channel.
- 3)For the maximum output power measurement, we followed the method of measurement ANSI C63.10.
- 4)For the spurious emission test based on ANSI C63.10, at the frequency where below 1GHz used quasi-peak detector mode; where above 1GHz used the peak and average detector mode. IF the peak value may be under average limit, the average mode will not be performed.

3.5 MEASUREMENT UNCERTAINTY

Measurement Item	Uncertainty
Radiated emission	±4.11dB
Peak Output Power(conducted)	±1.38dB
Peak Output Power(Radiated)	±1.70dB
Power Spectral Density	±1.39dB
Radiated emission(3m)	±4.11dB
Radiated emission(10m)	±3.89dB



3.6 DESCRIPTION OF THE SUPPORT EQUIPMENTS

Setup Diagram

See test photographs attached in appendix 1 for the actual connections between EUT and support equipment.

Support Equipment

Peripherals Devices:

Description	Manufacturer	Model No.	Serial No.
Adapter	amber	APC-01	N/A
Load(for 5V)	N/A	N/A	N/A
Load(for 9V)	N/A	N/A	N/A

Note: All the above equipment /cable were placed in worse case position to maximize emission signals during emission test

Grounding: Grounding was in accordance with the manufacturer' s requirement and conditions for the intended use.



4. TEST AND MEASUREMENT EQUIPMENT

4.1 CALIBRATION

The measuring equipment utilized to perform the tests documented in the report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 EQUIPMENT

The following list contains measurement equipment used for testing. The equipment conforms to the requirement of CISPR 16-1, ANSI C63.2 and other required standards. Calibration of all test and measurement, including any accessories that may effect such calibration, is checked frequently to ensure the accuracy. Adjustments are made and correction factors are applied in accordance with the instructions contained in the respective.

**TABLELIST OF TEST AND MEASUREMENT EQUIPMENT**

Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
EMI Receiver	R&S	ESHS10	830223/008	2019/06/05
LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2019/06/10
ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158-0094	2019/09/21
RF Cable	N/A	N/A	EMI-3	2019/10/19
Bilog antenna(30M-1G)	ETC	MCTD2786 B	BLB16M040 04/JB-5-004	2019/05/17
Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N020 09	2018/11/23
Horn antenna (18G-26G)	com-power	AH-826	81000	2019/08/16
LOOP Antenna (Below 30M)	com-power	AL-130	17117	2019/10/04
Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2019/05/02
Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC05184 5	980108&AT -18001	2019/10/23
Pre amplifier (18G~26G)	MITEQ	JS4-180026 00-30-5A	808329	2019/08/09
EMI Test Receiver	R&S	ESVS30 (20M-1000 MHz)	826006/002	2018/11/28
RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2019/10/19
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(4 M+4M)	NA	2019/04/16
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(7 M)	NA	2019/08/09
Spectrum (9K--7GHz)	R&S	FSP7	830180/006	2019/04/13
Spectrum (9K--40GHz)	AGILENT	8564EC	4046A0032	2019/03/01
e3	AUDIX	N/A	N/A	N/A
SINGAL GENTERATOR (100k-1GHz)	HP	8648A	3619U00426	N/A
Power Meter	ANRITSU	ML2487	6K00001574	2019/08/09

***CALIBRATION INTERVAL OF INSTRUMENTS LISTED ABOVE IS ONE YEAR**



5. ANTENNA REQUIREMENTS

5.1 STANDARD APPLICABLE

According to the FCC Part 15 Paragraph 15.203, 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.

5.2 ANTENNA CONSTRUCTION AND DIRECTIONAL GAIN

WPC		
Antenna Type	:	Loop Antenna
Antenna Gain	:	0 dBi



6. TEST OF CONDUCTED EMISSION

6.1 TEST LIMIT

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 120 VAC power and return leads of the EUT according to the methods defined in ANSI C63.10-2013. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

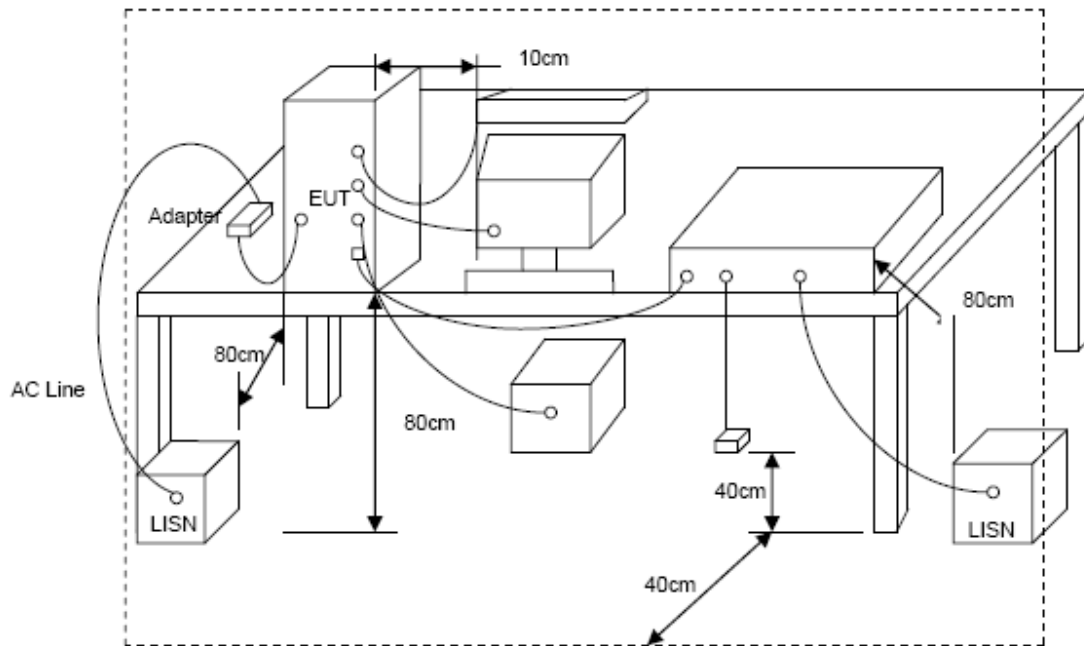
*Decreases with the logarithm of the frequency.

6.2 TEST PROCEDURES

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



6.3 TYPICAL TEST SETUP

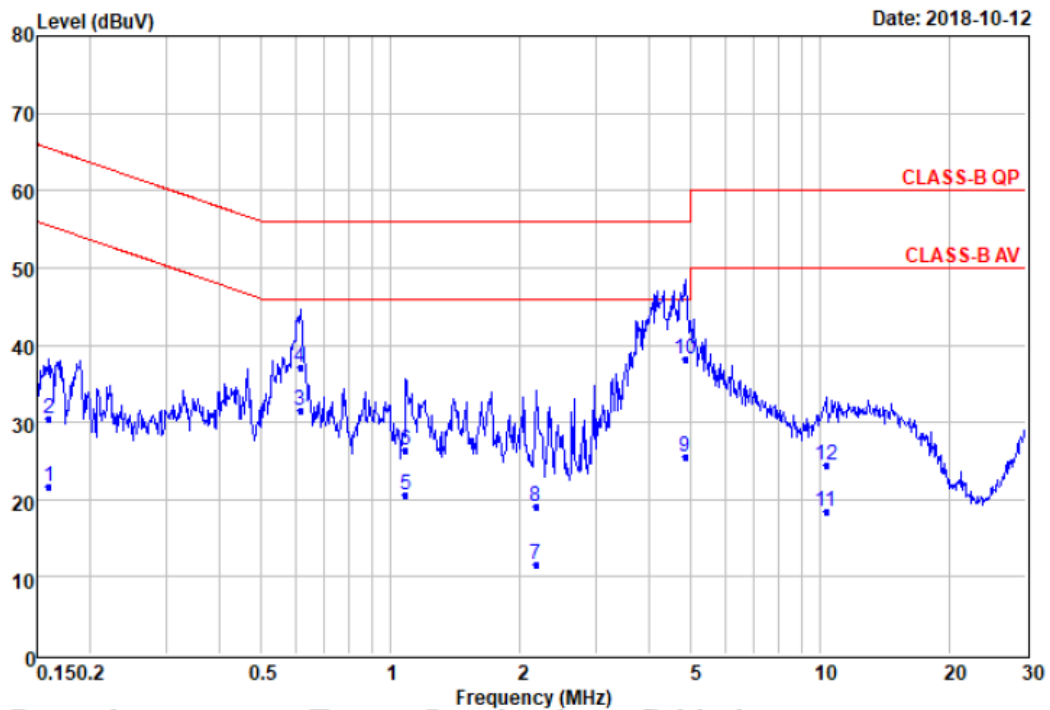




6.4 TEST RESULT AND DATA

M/N :	GA-9100B	Test Voltage:	AC 120V/60Hz
Test Date :	Oct 12, 2018	Phase:	L1
Temperature:	24°C	Relative Humidity:	58%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		

Data: 2



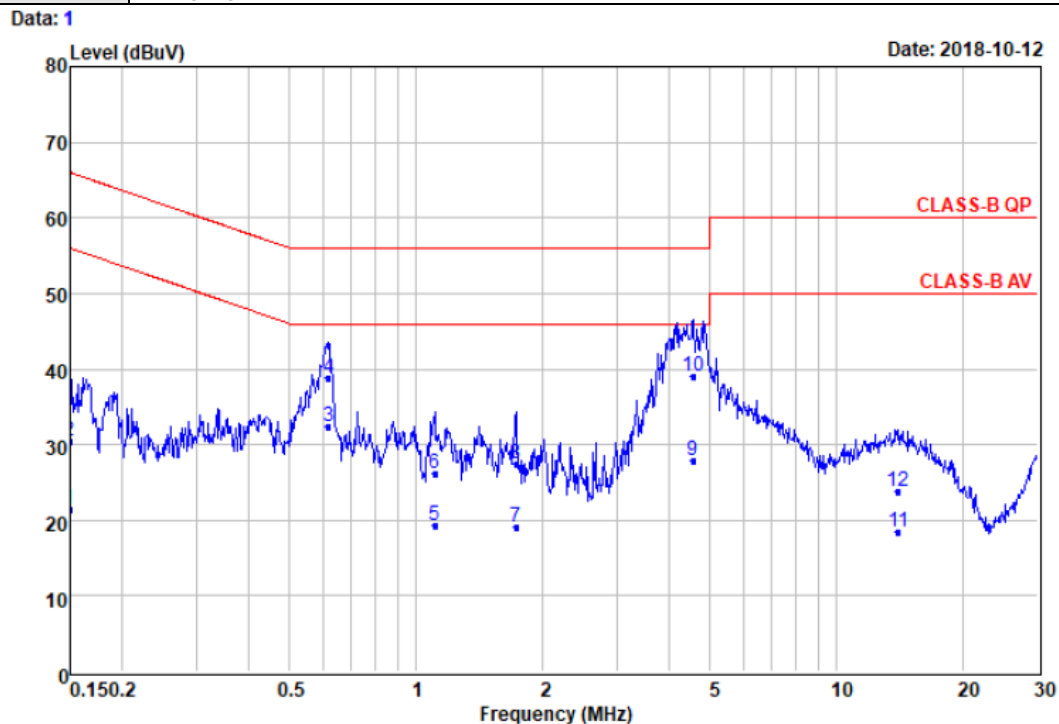
Remarks

: Factor=Insrtion loss+Cable loss

	Freq	Read Level	Level Factor	Over Limit	Limit Line	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV
1	0.16	11.50	21.61	10.11	-33.86	55.47 Average
2	0.16	20.30	30.41	10.11	-35.06	65.47 QP
3 @	0.61	21.30	31.44	10.14	-14.56	46.00 Average
4	0.61	27.00	37.14	10.14	-18.86	56.00 QP
5	1.08	10.51	20.67	10.16	-25.33	46.00 Average
6	1.08	16.31	26.47	10.16	-29.53	56.00 QP
7	2.18	1.31	11.52	10.21	-34.48	46.00 Average
8	2.18	8.91	19.12	10.21	-36.88	56.00 QP
9	4.85	15.20	25.51	10.31	-20.49	46.00 Average
10	4.85	27.80	38.11	10.31	-17.89	56.00 QP
11	10.29	8.00	18.45	10.45	-31.55	50.00 Average
12	10.29	14.10	24.55	10.45	-35.45	60.00 QP



M/N :	GA-9100B	Test Voltage:	AC 120V/60Hz
Test Date :	Oct 12, 2018	Phase:	Neutral
Temperature:	24°C	Relative Humidity:	58%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		



Remarks : Factor=Insertion loss+Cable loss

	Freq	Read Level	Level	Factor	Over Limit	Limit	Line	Remark
	MHz	dBuV	dBuV	dB	dB	dBuV		
1	0.15	11.30	21.39	10.09	-34.61	56.00	Average	
2	0.15	20.30	30.39	10.09	-35.61	66.00	QP	
3	0.62	22.20	32.33	10.13	-13.67	46.00	Average	
4	0.62	28.70	38.83	10.13	-17.17	56.00	QP	
5	1.11	9.21	19.36	10.15	-26.64	46.00	Average	
6	1.11	16.01	26.16	10.15	-29.84	56.00	QP	
7	1.73	9.00	19.19	10.19	-26.81	46.00	Average	
8	1.73	17.30	27.49	10.19	-28.51	56.00	QP	
9	4.55	17.70	27.98	10.28	-18.02	46.00	Average	
10	4.55	28.80	39.08	10.28	-16.92	56.00	QP	
11	13.99	8.00	18.51	10.51	-31.49	50.00	Average	
12	13.99	13.30	23.81	10.51	-36.19	60.00	QP	



7. TEST OF RADIATED EMISSION

7.1 TEST LIMIT

In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. If the transmitter measurement is based on the maximum conducted output power, the attenuation required under this paragraph shall be 30dB instead of 20dB. In addition, radiated emissions which fall in section 15.205(a) the restricted bands must also comply with the radiated emission limit specified in section 15.209(a).

Frequency (MHz)	Field Strength (microvolt/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

7.2 TEST PROCEDURES

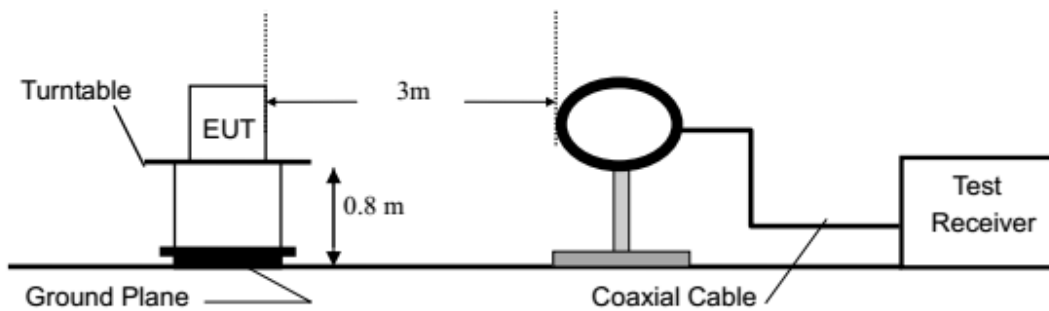
- The EUT was placed on a rotatable table top 0.8 meter above ground.
- The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- The table was rotated 360 degrees to determine the position of the highest radiation.
- The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported,



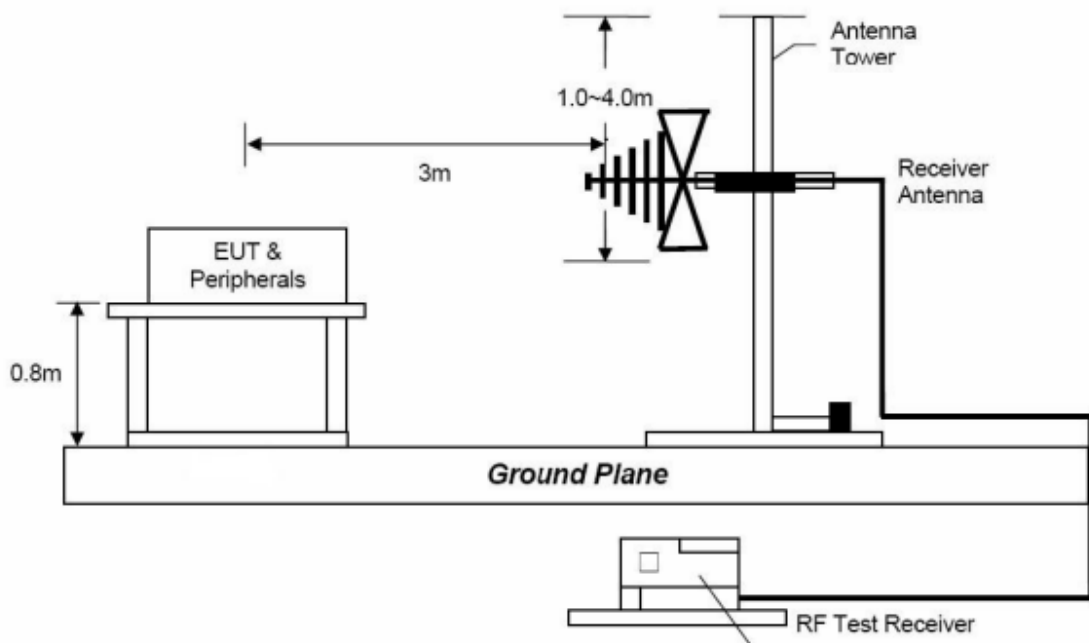
- otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
 - i. "Cone of radiation" has been considered to be 3dB bandwidth of the measurement antenna.

7.3 TYPICAL TEST SETUP

Radiated Emission Test Set-Up, Frequency Below 30MHz



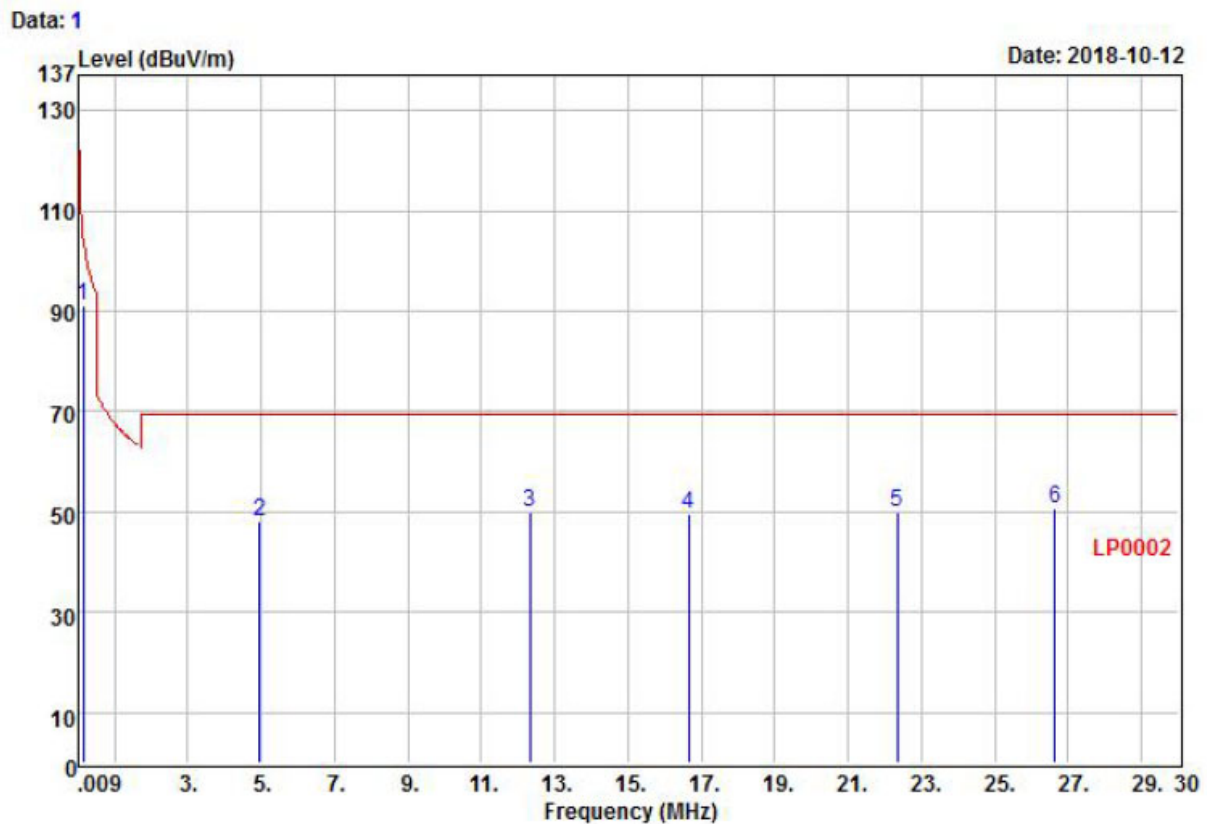
Radiated Emission Test Set-Up, Frequency 30MHz-1000MHz





7.4 TEST RESULT AND DATA (9KHZ ~ 30MHZ)

M/N :	GA-9100B	Test Voltage:	AC 120V/60Hz
Test Date :	Oct 12, 2018	Phase:	HORIZONTAL
Temperature:	23°C	Relative Humidity:	70%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		



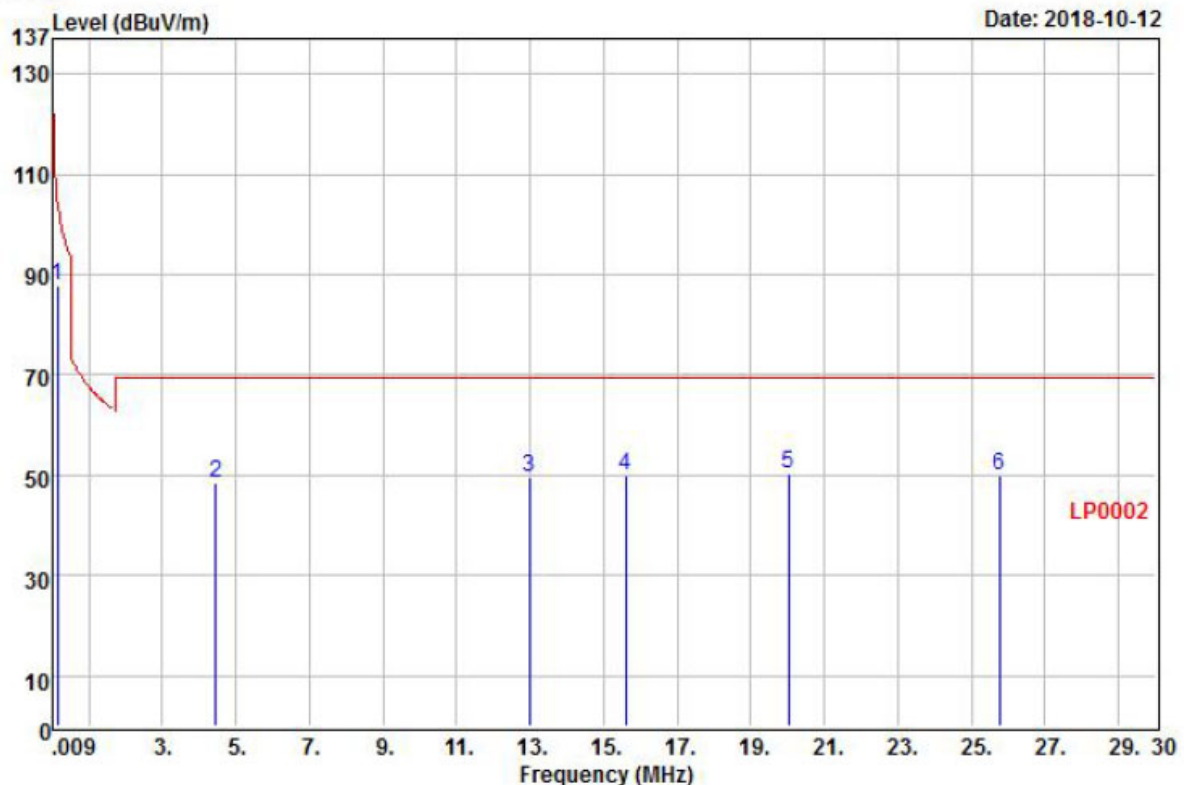
Remarks : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor-Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	0.14	91.12	0.00	91.12	104.87	-13.75	Average
2	4.95	36.87	11.27	48.14	69.50	-21.36	QP
3	12.32	37.89	12.19	50.08	69.50	-19.42	QP
4	16.65	37.24	12.33	49.57	69.50	-19.93	QP
5	22.33	37.86	12.22	50.08	69.50	-19.42	QP
6	26.64	38.84	11.85	50.69	69.50	-18.81	QP



M/N :	GA-9100B	Test Voltage:	AC 120V/60Hz
Test Date :	Oct 12, 2018	Phase:	Vertical
Temperature:	23°C	Relative Humidity:	70%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		

Data: 2



Remarks : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor-Cable loss-
: Amplifier Factor

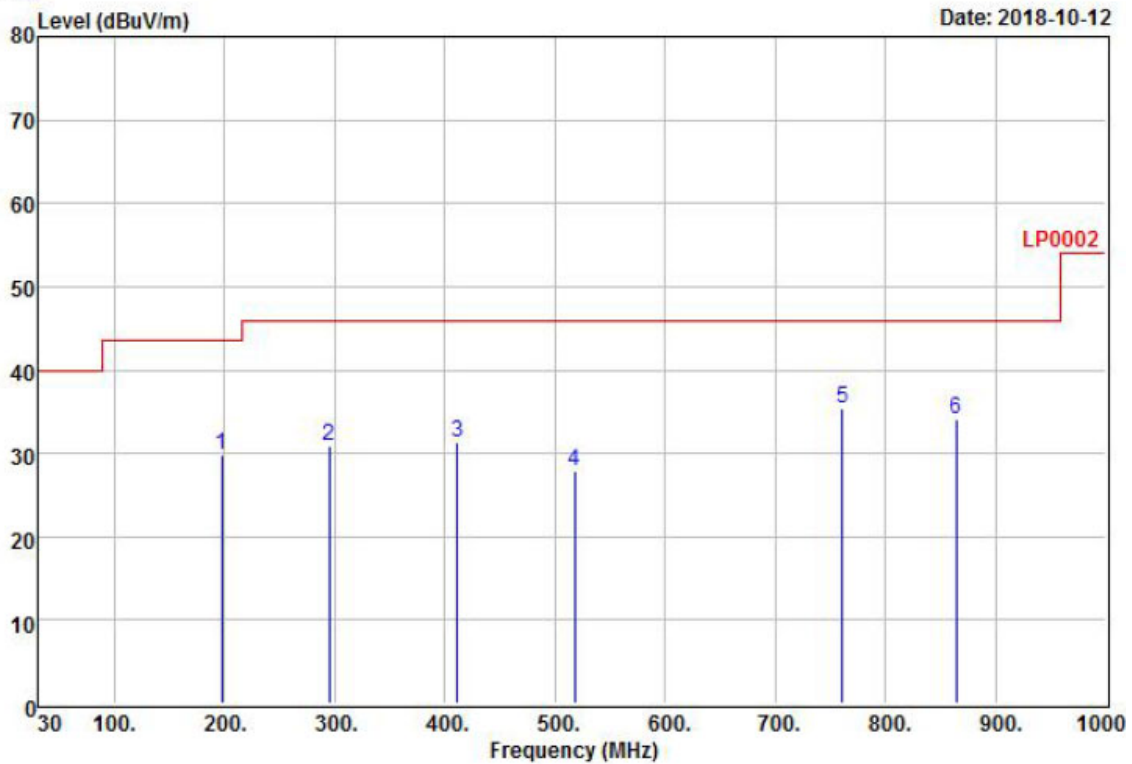
	Freq	Read Level	Factor	Level	Limit	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1 @	0.14	77.06	10.84	87.90	104.87	-16.97	Average
2	4.45	37.35	11.09	48.44	69.50	-21.06	QP
3	12.99	37.52	12.22	49.74	69.50	-19.76	QP
4	15.59	37.67	12.30	49.97	69.50	-19.53	QP
5	20.03	37.76	12.42	50.18	69.50	-19.32	QP
6	25.76	38.15	11.91	50.06	69.50	-19.44	QP



7.5 TEST RESULT AND DATA (30MHZ ~ 1GHZ, WORST EMISSIONS FOUND)

M/N :	GA-9100B	Test Voltage:	AC 120V/60Hz
Test Date :	Oct 12, 2018	Phase:	Horizontal
Temperature:	23°C	Relative Humidity:	70%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		

Data: 3



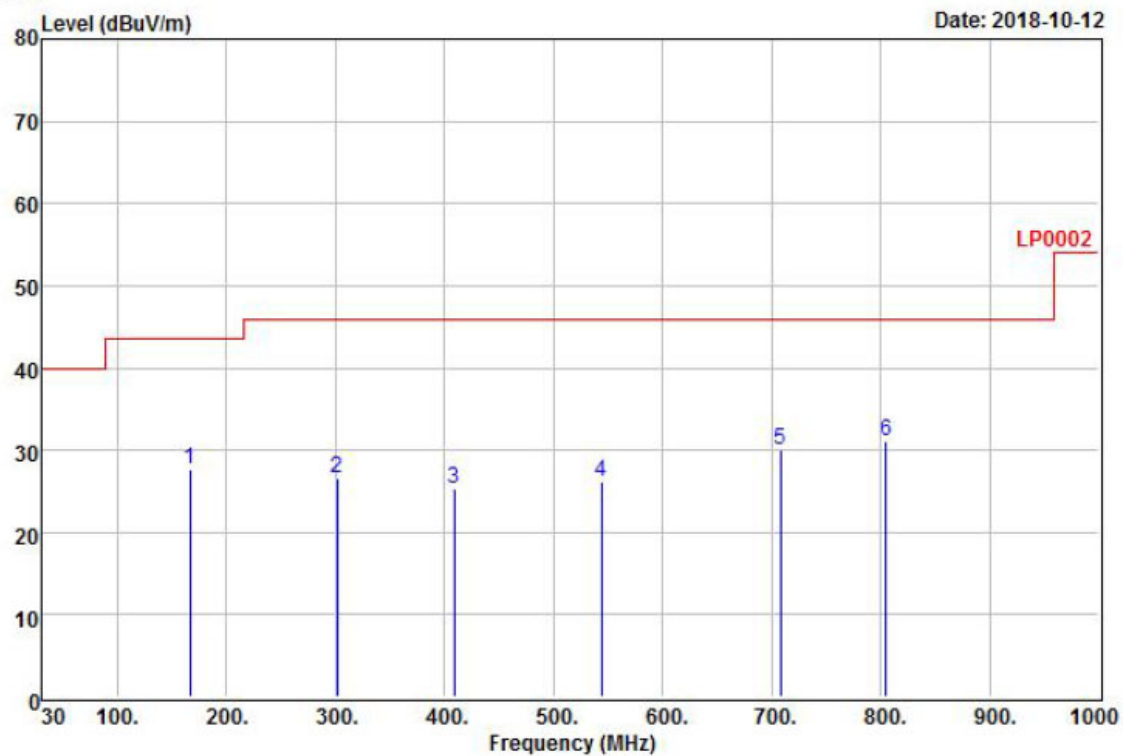
Remarks : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor-Cable loss-
: Amplifier Factor

	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	
1	197.34	48.14	-18.33	29.81	43.50	-13.69	QP
2	294.79	44.36	-13.45	30.91	46.00	-15.09	QP
3	411.65	41.74	-10.53	31.21	46.00	-14.79	QP
4	518.20	36.72	-8.84	27.88	46.00	-18.12	QP
5 @	761.25	41.02	-5.64	35.38	46.00	-10.62	QP
6	864.89	37.94	-3.74	34.20	46.00	-11.80	QP



M/N :	GA-9100B	Test Voltage:	AC 120V/60Hz
Test Date :	Oct 12, 2018	Phase:	Vertical
Temperature:	23°C	Relative Humidity:	70%
Pressure:	101.0KPa	Test by:	Bing
Test Mode:	Charging		

Data: 4



Remarks : 1.Result=Read Value+Factor
: 2.Factor=Antenna Factor-Cable loss-
: Amplifier Factor

	Freq	Read		Limit	Over	
	MHz	Level	Factor	Line	Limit	Remark
	MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB
1	166.37	45.37	-17.60	27.77	43.50	-15.73 QP
2	301.03	39.90	-13.30	26.60	46.00	-19.40 QP
3	408.44	35.87	-10.57	25.30	46.00	-20.70 QP
4	544.15	34.76	-8.66	26.10	46.00	-19.90 QP
5	708.01	36.83	-6.80	30.03	46.00	-15.97 QP
6 @	805.12	35.84	-4.81	31.03	46.00	-14.97 QP



8. RESTRICTED BANDS OF OPERATION

Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.09000 – 0.11000	16.42000 – 16.42300	399.9 – 410.0	4.500 – 5.150
0.49500 – 0.505**	16.69475 – 16.69525	608.0 – 614.0	5.350 – 5.460
2.17350 – 2.19050	16.80425 – 16.80475	960.0 – 1240.0	7.250 – 7.750
4.12500 – 4.12800	25.50000 – 25.67000	1300.0 – 1427.0	8.025 – 8.500
4.17725 – 4.17775	37.50000 – 38.25000	1435.0 – 1626.5	9.000 – 9.200
4.20725 – 4.20775	73.00000 – 74.60000	1645.5 – 1646.5	9.300 – 9.500
6.21500 – 6.21800	74.80000 – 75.20000	1660.0 – 1710.0	10.600 – 12.700
6.26775 – 6.26825	108.00000 – 121.94000	1718.8 – 1722.2	13.250 – 13.400
6.31175 – 6.31225	123.00000 – 138.00000	2200.0 – 2300.0	14.470 – 14.500
8.29100 – 8.29400	149.90000 – 150.05000	2310.0 – 2390.0	15.350 – 16.200
8.36200 – 8.36600	156.52475 – 156.52525	2483.5 – 2500.0	17.700 – 21.400
8.37625 – 8.38675	156.70000 – 156.90000	2655.0 – 2900.0	22.010 – 23.120
8.41425 – 8.41475	162.01250 – 167.17000	3260.0 – 3267.0	23.600 – 24.000
12.29000 – 12.29300	167.72000 – 173.20000	3332.0 – 3339.0	31.200 – 31.800
12.51975 – 12.52025	240.00000 – 285.00000	3345.8 – 3358.0	36.430 – 36.500
12.57675 – 12.57725	322.00000 – 335.40000	3600.0 – 4400.0	Above 38.6
13.36000 – 13.41000			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

8.1 LABELING REQUIREMENT

The device shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

--END--