

Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

FCC 47 CFR PART 15 SUBPART C TEST REPORT

FOR

Fast Wireless Charger

Model: WP-5210
Trade Name: Gigastone

Issued to

Gigastone Corporation.
12F, No. 480, Rueiguang Road Neihu Distrist, Taipei 114, Taiwan, R.O.C.
Issued by
WH Technology Corp.





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Date of Issue: Jan 15, 2020 Report No. : WH-FCC-R19122704-C FCC ID. : PLE-WP-5210

1. GENERAL INFORMATION	٠
2. REPORT OF MEASUREMENTS AND EXAMINATIONS	4
2.1 List of Measurements and Examinations	4
3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST	5
3.1 DESCRIPTION OF THE TESTED SAMPLES	5 5
4. TEST AND MEASUREMENT EQUIPMENT	8
4.1 CALIBRATION4.2 EQUIPMENT	
5. ANTENNA REQUIREMENTS	10
5.1 STANDARD APPLICABLE	
6. TEST OF CONDUCTED EMISSION	11
6.1 TEST LIMIT	11 12
7. TEST OF RADIATED EMISSION	19
7.1 TEST LIMIT	19 20 21
8. RESTRICTED BANDS OF OPERATION	25
8 1 Larfling Requirement	25



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID. : PLE-WP-5210

1. GENERAL INFORMATION

Applicant : Gigastone Corporation.

Address : 12F, No. 480, Rueiguang Road Neihu Distrist, Taipei 114,

Taiwan, R.O.C.

Manufacturer/

Factory

: Gigastone Corporation.

Address : 12F, No. 480, Rueiguang Road Neihu Distrist, Taipei 114,

Taiwan, R.O.C.

EUT : Fast Wireless Charger

Model Name : WP-5210

Trade Name : Gigastone

Model : N/A

Differences

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

(Date)

Receipt Date: 12/27/2019 Final Test Date: 01/15/2020

Tested By: Reviewed by:

Jan 15, 2020

Bing Chang/ Engineer (Date)

Bell Wei / Manager

Designation Number: TW2954

Jan 15, 2020



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

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



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

3. TEST CONFIGURATION OF EQUIPMENT UNDER TEST

3.1 DESCRIPTION OF THE TESTED SAMPLES

EUT Name	Fast Wireless Charger
Model Number	WP-5210
FCC ID	PLE-WP-5210
Input Voltage	5Vdc, 2A; 9Vdc, 2A
Output	5Vdc, 1.5A; 9Vdc, 1.12A 10W Max
Operate Frequency	110KHz-205KHz
Antenna Type	Coil 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 Adapter and EUT for RF test.
- c. only the worst case was recorded in this report



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

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



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

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	N/A	15W	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.



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

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.



Date of Issue: Jan 15, 2020

Report No. : WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

TABLELIST OF TEST AND MEASUREMENT EQUIPMENT

Instrument	Manufacturer	Model No.	S/N	Next Cal. Date
EMI Receiver	R&S	ESHS10	830223/008	2020/06/05
LISN	Rolf Heine Hochfrequenztechnik	NNB-2/16z	98062	2020/06/10
ISN	Schwarzbeck	8-Wire ISN CAT5	CAT5-8158- 0094	2020/09/21
RF Cable	N/A	N/A	EMI-3	2020/10/19
Bilog antenna(30M-1G)	ETC	MCTD2786 B	BLB16M040 04/JB-5-004	2020/05/17
Double Ridged Guide Horn antenna(1G-18G)	ETC	MCTD 1209	DRH15N020 09	2020/11/23
Horn antenna (18G-26G)	com-power	AH-826	81000	2020/08/16
LOOP Antenna (Below 30M)	com-power	AL-130	17117	2020/10/04
Pre amplifier (30M-1G)	EMC INSTRUMENT	EMC9135	980334	2020/05/02
Microwave Preamplifier (1G-18G)	EMC INSTRUMENT	EMC05184 5	980108&AT -18001	2020/10/23
Pre amplifier (18G~26G)	MITEQ	JS4-180026 00-30-5A	808329	2020/08/09
EMI Test Receiver	R&S	ESVS30 (20M-1000 MHz)	826006/002	2020/11/28
RF Cable (open site)	EMCI	N male on end of both sides (EMI4)	30m	2020/10/19
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(4 M+4M)	NA	2020/04/16
RF CABLE (1~26G)	HARBOUT INDUSTRIES	LL142MI(7 M)	NA	2020/08/09
Spectrum (9K7GHz)	R&S	FSP7	830180/006	2020/04/13
Spectrum (9K40GHz)	AGILENT	8564EC	4046A0032	2020/03/01
e3	AUDIX	N/A	N/A	N/A
SINGAL GENTERATOR (100k-1GHz)	HP	8648A	3619U0042 6	N/A
Power Meter	ANRITSU	ML2487	6K00001574	2020/08/09



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

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		Coil Antenna		
Antenna Gain	:	0 dBi		



Date of Issue: Jan 15, 2020

Report No. : WH-FCC-R19122704-C FCC ID. : PLE-WP-5210

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

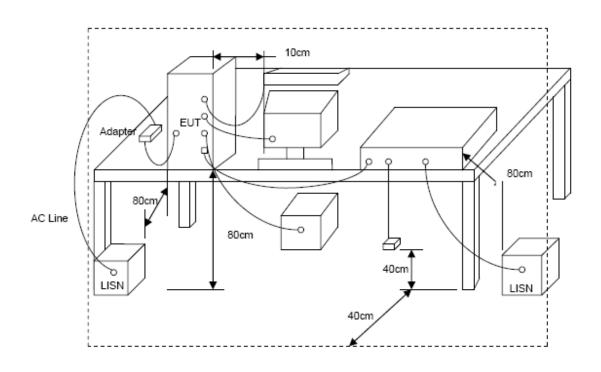
- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other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



Date of Issue: Jan 15, 2020 Report No. : WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

6.3 TYPICAL TEST SETUP



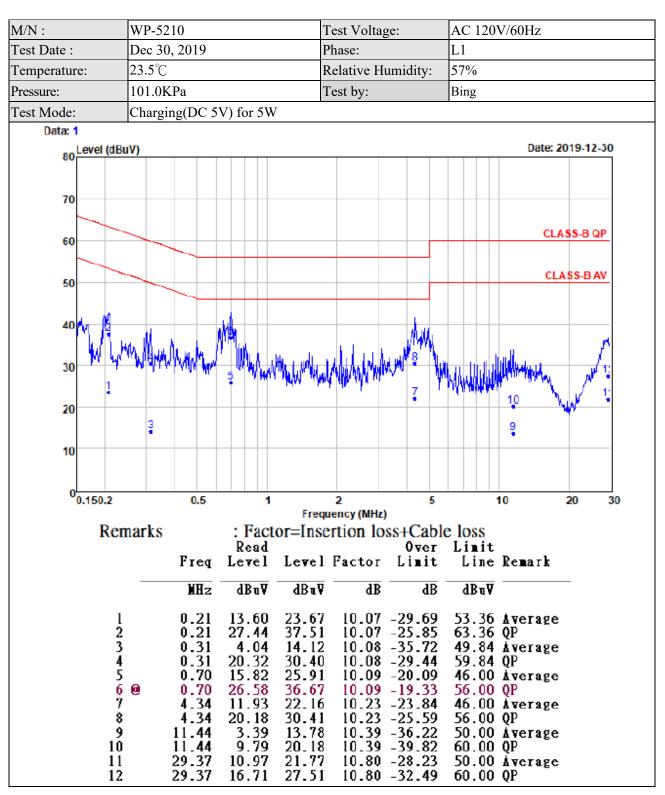


Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

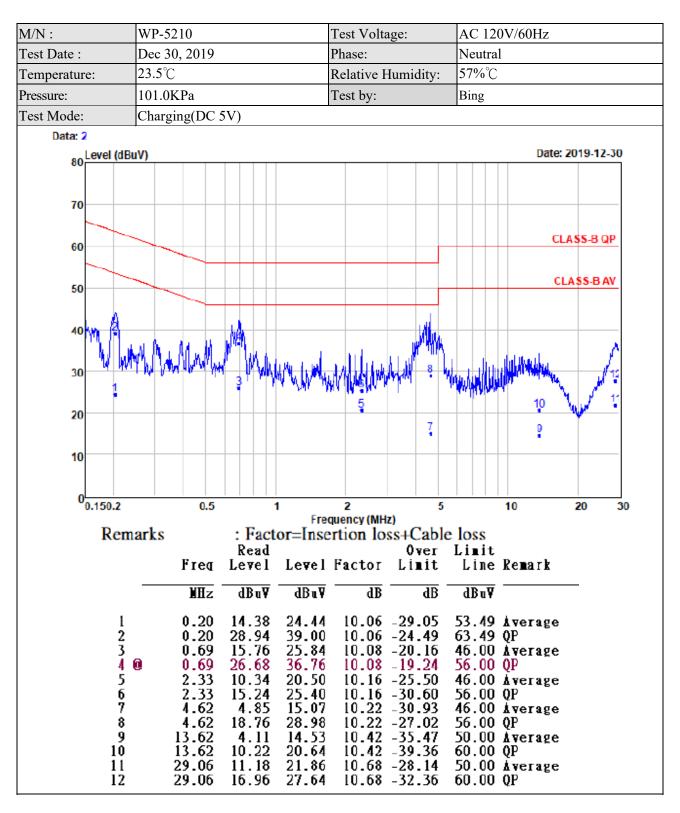
FCC ID.: PLE-WP-5210

6.4 TEST RESULT AND DATA



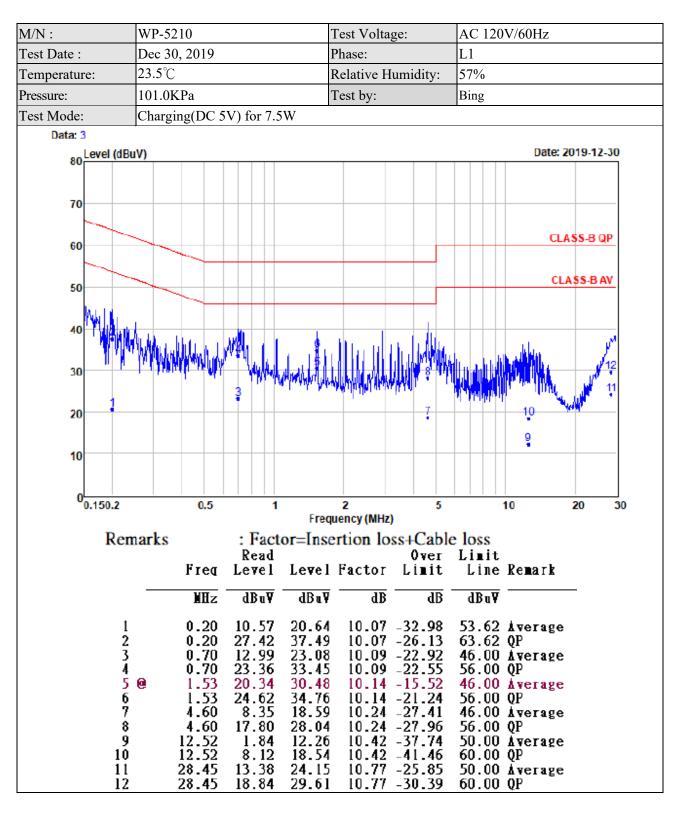


Date of Issue: Jan 15, 2020 Report No. : WH-FCC-R19122704-C



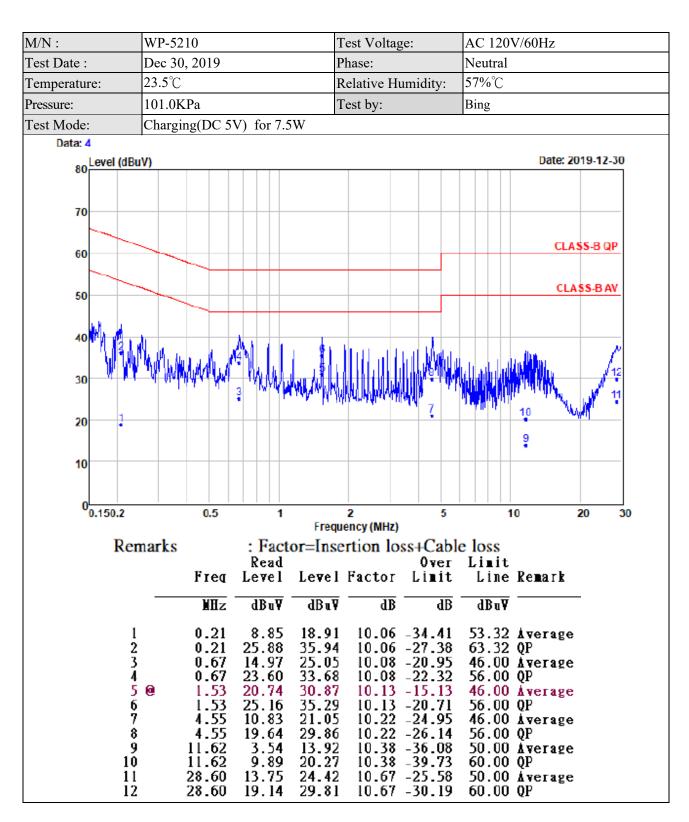


Date of Issue: Jan 15, 2020 Report No. : WH-FCC-R19122704-C



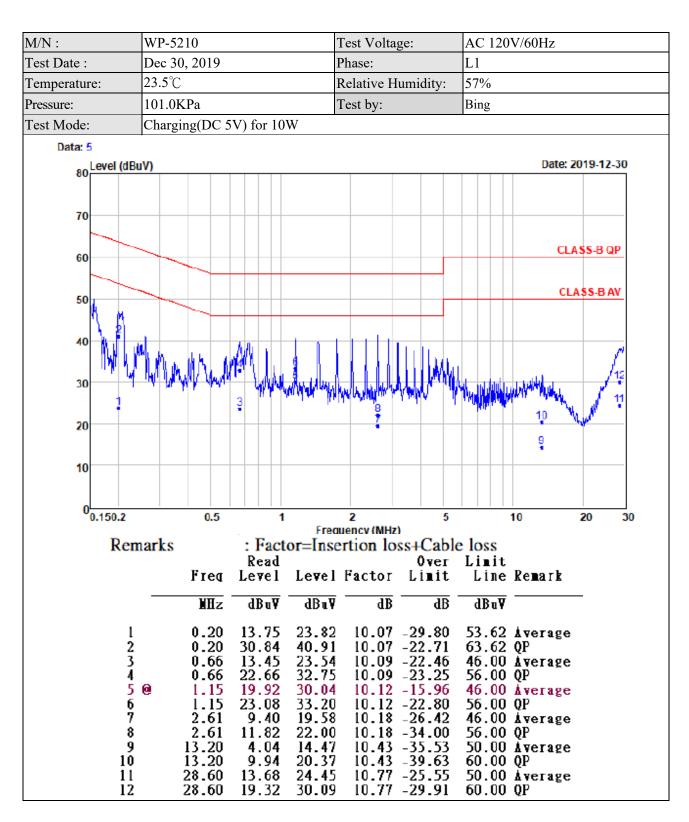


Date of Issue: Jan 15, 2020 Report No. : WH-FCC-R19122704-C





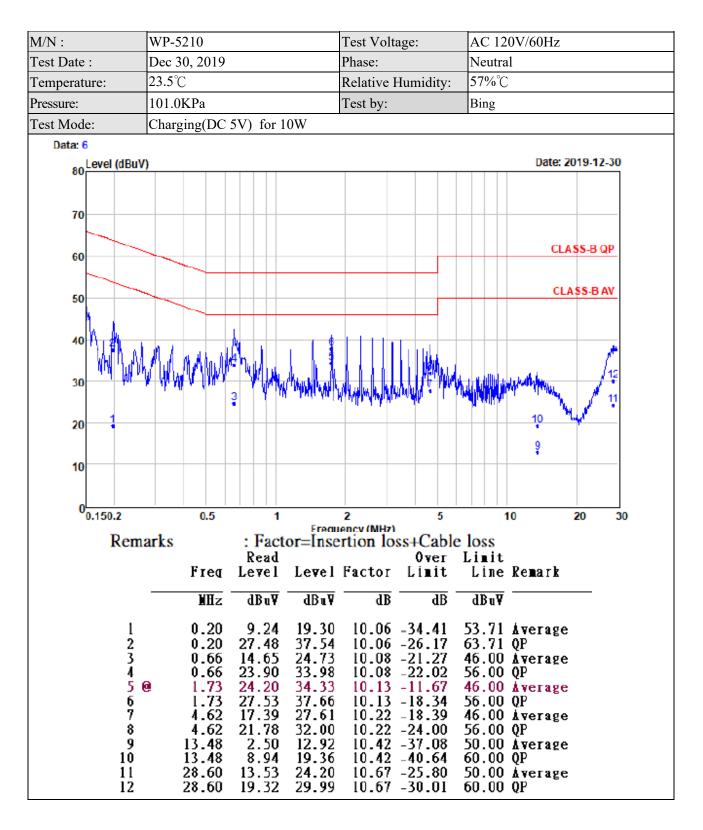
Date of Issue: Jan 15, 2020 Report No. : WH-FCC-R19122704-C





Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C





Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

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

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. 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.
- e. 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.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. 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,



Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

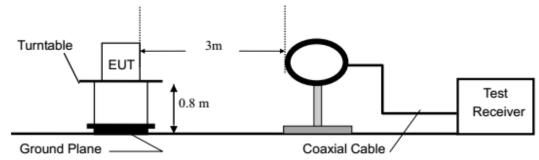
FCC ID.: PLE-WP-5210

otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

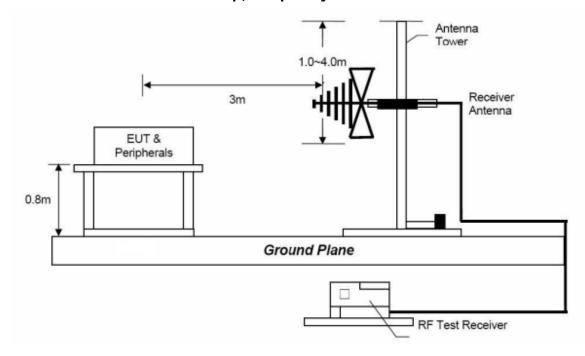
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower thanaverage limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured 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



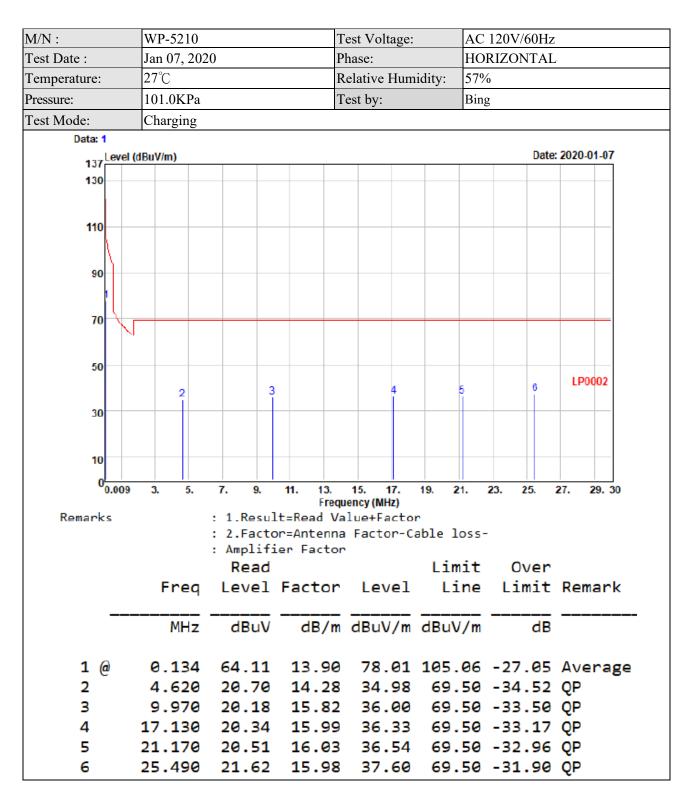


Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

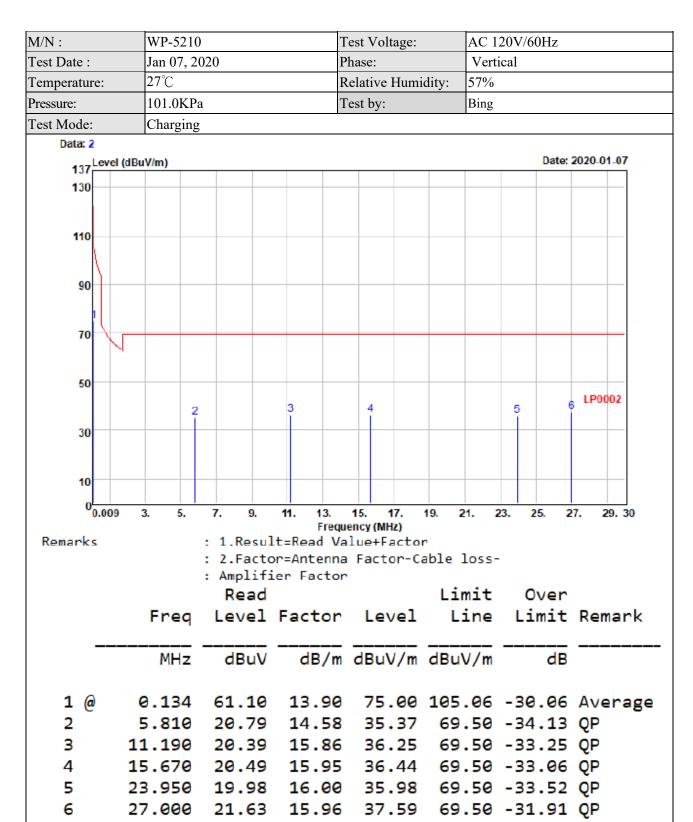
FCC ID.: PLE-WP-5210

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





Date of Issue: Jan 15, 2020 Report No.: WH-FCC-R19122704-C



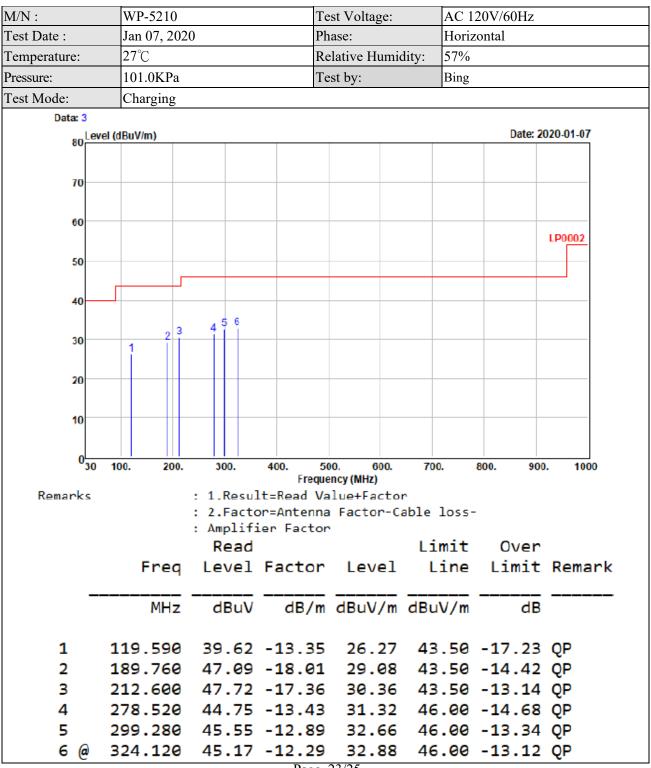


Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

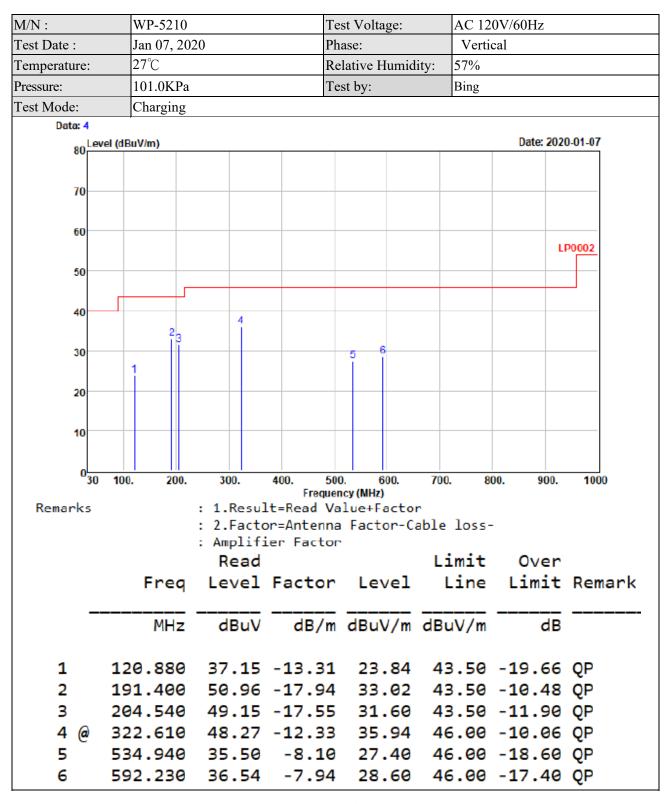
7.5 TEST RESULT AND DATA (30MHZ ~ 1GHZ, WORST EMISSIONS FOUND)



Page 23/25



Date of Issue: Jan 15, 2020 Report No.: WH-FCC-R19122704-C





Date of Issue: Jan 15, 2020

Report No.: WH-FCC-R19122704-C

FCC ID.: PLE-WP-5210

8. RESTRICTED BANDS OF OPERATION

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

only opanicus on modern are permitted in any or the median serious serious						
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---