

# FCC Test Report

# Report No.: AGC01040240701FR02

FCC ID	:	2AF9HCS500
APPLICATION PURPOSE	:	Original Equipment
PRODUCT DESIGNATION	:	Cycling Computer
BRAND NAME	:	COOSPO
MODEL NAME	:	CS500, CS510, CS520, CS530, CS550, CS560, CS570, CS580, CS590, CS600, CS700, CS800, CS900, CS1000
APPLICANT	:	Shenzhen CooSpo Tech Co., Ltd
DATE OF ISSUE	:	Jul. 18, 2024
STANDARD(S)	:	FCC Part 15 Subpart C §15.249
<b>REPORT VERSION</b>	:	V1.0







## **Report Revise Record**

Report Version	Revise Time	Issued Date	Valid Version	Notes	
V1.0	/	Jul. 18, 2024	Valid	Initial Release	



## **Table of Contents**

1. General Information	4
2. Product Information	5
2.1 Product Technical Description	5
2.2 Test Frequency List	5
2.3 Related Submittal(S) / Grant (S)	6
2.4 Test Methodology	6
2.5 Antenna Requirement	6
3. Test Environment	7
3.1 Address of the Test Laboratory	7
3.2 Test Facility	7
3.3 Environmental Conditions	
3.4 Measurement Uncertainty	
3.5 List of Equipment Use	
4.System Test Configuration	10
4.1 EUT Configuration	
4.2 EUT Exercise	
4.3 Configuration of Tested System	
4.4 Equipment Used In Tested System	
4.5 Summary of Test Results	
5. Description of Test Modes	12
6. Duty Cycle Measurement	13
7. 20dB Bandwidth Measurement	14
7.1 Provisions Applicable	14
7.2 Measurement Procedure	
7.3 Measurement Setup (Block Diagram of Configuration)	
7.4 Measurement Results	
8. Field Strength of Fundamental and Radiated Spurious Emission	
8.1 Measurement Limit	
8.2 Measurement Procedure	17
8.3 Measurement Setup (Block Diagram of Configuration)	
8.4 Measurement Results	21
9. AC Power Line Conducted Emission	
9.1 Measurement Limit	
9.2 Measurement Setup (Block Diagram of Configuration)	
9.3 Preliminary Procedure of Line Conducted Emission Test	
9.4 Final Procedure of Line Conducted Emission Test	
9.5 Measurement Resul	
Appendix I: Photographs of Test Setup	
Appendix II: Photographs of Test EUT	



## **1. General Information**

Applicant	Shenzhen CooSpo Tech Co., Ltd
Address	Room 602, 1# building, Lingyun Factory, Liufang Road 2nd, Xingdong Community, Bao'an District, Shenzhen, Guangdong, China
Manufacturer	Shenzhen CooSpo Tech Co., Ltd
Address	Room 602, 1# building, Lingyun Factory, Liufang Road 2nd, Xingdong Community, Bao'an District, Shenzhen, Guangdong, China
Factory	Shenzhen CooSpo Tech Co., Ltd
Address	Room 602, 1# building, Lingyun Factory, Liufang Road 2nd, Xingdong Community, Bao'an District, Shenzhen, Guangdong, China
Product Designation	Cycling Computer
Brand Name	COOSPO
Test Model	CS500
Series Model(s)	CS510, CS520, CS530, CS550, CS560, CS570, CS580, CS590, CS600, CS700, CS800, CS900, CS1000
Difference Description	All the series models are the same as the test model except for the model names.
Date of receipt of test item	Jul. 08, 2024
Date of Test	Jul. 08, 2024~ Jul. 18. 2024
Deviation from Standard	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Test Report Form No	AGCER-FCC-ANT+-V1

Note: The test results of this report relate only to the tested sample identified in this report.

Prepared By

Jouk Gai

Jack Gui (Project Engineer)

Jul. 18. 2024

**Reviewed By** 

in Lin

Calvin Liu (Reviewer)

Jul. 18. 2024

Approved By

Max Zhang

Max Zhang (Authorized Officer)

Jul. 18. 2024



## 2. Product Information

#### 2.1 Product Technical Description

Equipment Specification	Low Power Short Range Equipment (ANT <sup>+</sup> )
Frequency Band	2400MHz-2483.5MHz
Operation Frequency	2457MHz
Modulation Type	GFSK
Field Strength of Fundamental	90.91dBµV/m (Peak)
Hardware Version	V1.4
Software Version	V1.0.1
Antenna Designation	PCB Antenna
Antenna Gain	-1.91dBi
Power Supply	DC 3.85V by battery or DC 5V by adapter

#### 2.2 Test Frequency List

Frequency Band	Channel Number	Test Frequency
2400~2483.5MHz	1	2457 MHz



#### 2.3 Related Submittal(S) / Grant (S)

This submittal(s) (test report) is intended for FCC ID: 2AF9HCS500, filing to comply with Part 2, Part 15 of the Federal Communication Commission rules.

#### 2.4 Test Methodology

The tests were performed according to following standards:

No.	Identity	Document Title				
1	FCC 47 CFR Part 2	Frequency allocations and radio treaty matters; general rules and regulations				
2	FCC 47 CFR Part 15	Radio Frequency Devices				
3	ANSI C63.10-2013	American National Standard for Testing Unlicensed Wireless Devices				

#### 2.5 Antenna Requirement

Standard Requirement

#### 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 non-detachable antenna inside the device cannot be replaced by the user at will. The gain of the antenna is -1.91dBi.



## 3. Test Environment

#### 3.1 Address of the Test Laboratory

Laboratory: Attestation of Global Compliance (Shenzhen) Co., Ltd.

Address: 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

#### 3.2 Test Facility

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

#### CNAS-Lab Code: L5488

Attestation of Global Compliance (Shenzhen) Co., Ltd. has been assessed and proved to follow CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories).

#### A2LA-Lab Cert. No.: 5054.02

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to follow ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### FCC-Registration No.: 975832

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files with Registration 975832.

#### IC-Registration No.: 24842 (CAB identifier: CN0063)

Attestation of Global Compliance (Shenzhen) Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the Certification and Engineering Bureau of Industry Canada. The acceptance letter from the IC is maintained in our files with Registration 24842.



#### **3.3 Environmental Conditions**

	Normal Conditions
Temperature range (°C)	15 - 35
Relative humidity range	20 % - 75 %
Pressure range (kPa)	86 - 106
Power supply	DC 3.85V by battery or DC 5V by adapter

#### **3.4 Measurement Uncertainty**

The reported uncertainty of measurement y  $\pm$ U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

Item	Measurement Uncertainty
Uncertainty of Conducted Emission for AC Port	$U_c = \pm 2.9 \text{ dB}$
Uncertainty of Radiated Emission below 1GHz	$U_c = \pm 3.9 \text{ dB}$
Uncertainty of Radiated Emission above 1GHz	$U_c = \pm 4.9 \text{ dB}$
Uncertainty of total RF power, conducted	$U_c = \pm 0.8 \text{ dB}$
Uncertainty of RF power density, conducted	$U_c = \pm 2.6 \text{ dB}$
Uncertainty of spurious emissions, conducted	U <sub>c</sub> = ±2 %
Uncertainty of Occupied Channel Bandwidth	U <sub>c</sub> = ±2 %



#### 3.5 List of Equipment Use

• R	RF Conducted Test System								
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)		
$\boxtimes$	AGC-ER-E036	Spectrum Analyzer	Agilent	N9020A	MY49100060	2024-05-24	2025-05-23		
$\boxtimes$	AGC-EM-A152	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-09-21	2025-09-20		
	N/A	RF Connection Cable	N/A	1#	N/A	Each time	N/A		
$\square$	N/A	RF Connection Cable	N/A	2#	N/A	Each time	N/A		

• F	Radiated Spurious Emission								
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)		
	AGC-EM-E046	EMI Test Receiver	R&S	ESCI	10096	2024-02-01	2025-01-31		
$\square$	AGC-EM-E116	EMI Test Receiver	R&S	ESCI	100034	2024-05-24	2025-05-23		
$\square$	AGC-EM-E061	Spectrum Analyzer	Agilent	N9010A	MY53470504	2024-05-28	2025-05-27		
$\square$	AGC-EM-E086	Loop Antenna	ZHINAN	ZN30900C	18051	2024-03-05	2026-03-04		
$\boxtimes$	AGC-EM-E001	Wideband Antenna	SCHWARZBECK	VULB9168	D69250	2023-05-11	2025-05-10		
$\boxtimes$	AGC-EM-E029	Broadband Ridged Horn Antenna	ETS	3117	00034609	2024-03-31	2025-03-30		
$\square$	AGC-EM-E082	Horn Antenna	SCHWARZBECK	BBHA 9170	#768	2023-09-24	2025-09-23		
$\square$	AGC-EM-E146	Pre-amplifier	ETS	3117-PA	00246148	2022-08-04	2024-08-03		
$\boxtimes$	AGC-EM-A119	2.4G Filter	SongYi	N/A	N/A	2024-05-23	2025-05-22		
$\boxtimes$	AGC-EM-A138	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08		
	AGC-EM-A139	6dB Attenuator	Eeatsheep	LM-XX-6-5W	N/A	2023-06-09	2025-06-08		

• A	AC Power Line Conducted Emission								
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. Date (YY-MM-DD)	Next Cal. Date (YY-MM-DD)		
$\boxtimes$	AGC-EM-E045	EMI Test Receiver	R&S	ESPI	101206	2024-05-28	2025-05-27		
$\square$	AGC-EM-E023	AMN	R&S	100086	ESH2-Z5	2024-05-28	2025-05-27		

• Te:	Test Software					
Used	Equipment No.	Test Equipment	Manufacturer	Model No.	Version Information	
	AGC-EM-S001	CE Test System	R&S	ES-K1	V1.71	
	AGC-EM-S003	RE Test System	FARA	EZ-EMC	VRA-03A	
	AGC-ER-S012	BT/WIFI Test System	Tonscend	JS1120-2	2.6	
$\square$	AGC-EM-S011	RSE Test System	Tonscend	TS+-Ver2.1(JS36-RSE)	4.0.0.0	

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

 Attestation of Global Compliance(Shenzhen)Co., Ltd

 Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

 Tel: +86-755 2523 4088
 E-mail: agc@agccert.com

 Web: http://www.agccert.com/



## **4.System Test Configuration**

#### **4.1 EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

#### 4.2 EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

#### 4.3 Configuration of Tested System

Radiated Emission Configure:



Conducted Emission Configure:

EUT	AE

#### 4.4 Equipment Used In Tested System

The following peripheral devices and interface cables were connected during the measurement:

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1	Adapter	HUAWEI	HW-200440C00	Input(AC):100V-240V 50/60Hz 2.4A Output(DC):USB-C(5V/3A;9V/3A;10V/4A;11V/6A; 12V/3A;15V/3A;20V4.4A) USB-A(5V/2A;10V/4A;11V/6A;20V/4.4A)	
2	Control Box		USB-TTL		

Test Accessories Come From The Manufacturer

No.	Equipment	Model No.	Manufacturer	Specification Information	Cable
1					



#### 4.5 Summary of Test Results

Item	FCC Rules	Description of Test	Result
1	§15.203	Antenna Equipment	Pass
2	§15.249(a)	Field Strength of Fundamental	Pass
3	§15.209&§15.249(d)	Radiated Emission& Band Edge	Pass
4	§15.205	Restricted Bands of Operation	Pass
5	§15.215	20dB Bandwidth	Pass
6	§15.207	AC Power Line Conducted Emission	Pass



## 5. Description of Test Modes

Summary Table of Test Cases				
Test Item	Equipment type / Modulation			
rest item	Short Distance and Low Power Consumption/ GFSK			
Radiated & Conducted Test Cases	Mode 1: ANT <sup>+</sup> Normal transmission (2457MHz) (Battery powered or AC/DC adapter)			
AC Conducted Emission	Mode 1: ANT <sup>+</sup> Normal transmission (2457MHz) Battery + USB Cable (Charging from AC Adapter)			
Note:				
<ol> <li>Only the result of the worst case was recorded in the report, if no other cases.</li> <li>The battery is full-charged during the test.</li> </ol>				

- I ne battery is full-charged during the test.
   For Radiated Emission, 3axis were chosen for testing for each applicable mode.
- 4. For Conducted Test method, a temporary antenna connector is provided by the manufacture.



## 6. Duty Cycle Measurement

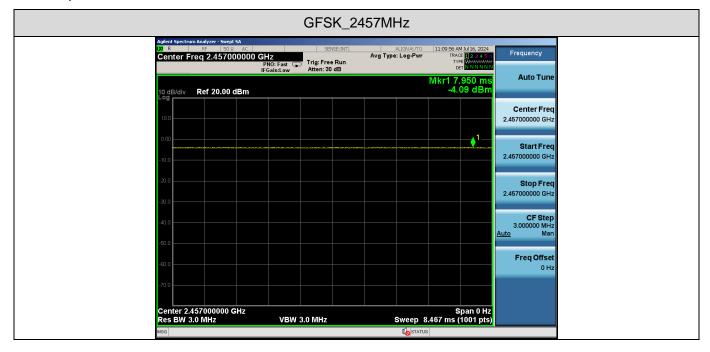
The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = Average. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

Operating mode	T(µs)	Duty Cycle (%)	Duty Cycle Factor (dB)
GFSK_2457MHz	/	100	/

Remark:

1. Duty Cycle factor = 10 \* log (1/ Duty cycle)

The test plots as follows:





## 7. 20dB Bandwidth Measurement

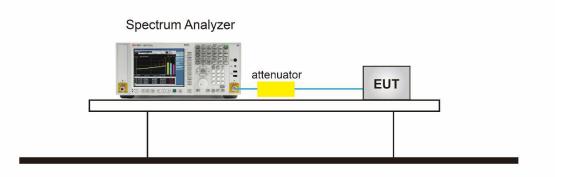
#### 7.1 Provisions Applicable

N/A

#### 7.2 Measurement Procedure

- 1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
- 2. Set to the maximum power setting and enable the EUT transmit continuously.
- 3. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 30 kHz. Set the Video bandwidth (VBW) = 100 kHz. In order to make an accurate measurement.
- For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 \* RBW.
- 5. Measure and record the results in the test report.

## 7.3 Measurement Setup (Block Diagram of Configuration)

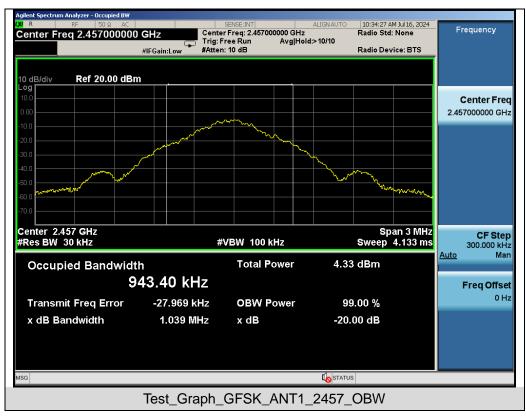




#### 7.4 Measurement Results

Test Data of Occupied Bandwidth and -20dB Bandwidth					
Test Mode	Test Frequency (MHz)	Occupied Bandwidth (MHz)	-20dB Bandwidth (MHz)	Limits (MHz)	Pass or Fail
GFSK	2457	0.9434	1.039	N/A	Pass

#### Test Graphs of Occupied Bandwidth and -20 Bandwidth





## 8. Field Strength of Fundamental and Radiated Spurious Emission

#### 8.1 Measurement Limit

15.249 Limit in the below table has to be followed:

Fraguenov Dongo	Field Strength of Fundamental	Field Strength of Harmonics	
Frequency Range	(millivolts/meter)	(microvolts/meter)	
900-928MHz	50	500	
2400-2483.5MHz	50	500	
5725-5875MHz	50	500	
24.0-24.25GHz	250	2500	

#### 15.209 Limit in the below table has to be followed:

Frequency Range	Distance	Field Strengths Limit	
(MHz)	Meters	μV/m	dB(µV)/m
0.009 ~ 0.490	300	2400/F(kHz)	
0.490 ~ 1.705	30	24000/F(kHz)	
1.705 ~ 30	30	30	
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	Other:74.0 dB(µV)/m (Peak)	) 54.0 dB(μV)/m (Average)

Remark:

1) Emission level dB $\mu$ V = 20 log Emission level  $\mu$ V/m.

2) The smaller limit shall apply at the cross point between two frequency bands.

3) Distance is the distance in meters between the measuring instrument, antenna and the closest point of any part of the device or system.

Note: All modes were tested for restricted band radiated emission, the test records reported below are the worst result compared to other modes.



#### 8.2 Measurement Procedure

- 1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average 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 for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions 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.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.



The following table is the setting of spectrum analyzer and receiver.

Spectrum Parameter	Setting
Start ~Stop Frequency	9kHz~150kHz/RB 200Hz for QP
Start ~Stop Frequency	150kHz~30MHz/RB 9kHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120kHz for QP
Start ~Stop Frequency	1GHz~26.5GHz
	1MHz/3MHz for Peak, 1MHz/3MHz for Average

Receiver Parameter	Setting
Start ~Stop Frequency	9kHz~150kHz/RB 200Hz for QP
Start ~Stop Frequency	150kHz~30MHz/RB 9kHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120kHz for QP

- The following is the test setup of Field Strength of Fundamental:
  - > Peak detection: RBW is greater than the main frequency OBW, VBW=50MHz / Sweep=AUTO
  - > Average detection: RBW is greater than the main frequency OBW, VBW=50MHz / Sweep=AUTO
- The following is the test setup of Band Edge:

The EUT operates at transmitting mode. The operate channel is tested to verify the largest transmission and spurious emissions power at the continuous transmission mode.

- Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
  - > Peak detection: RBW=1MHz, VBW=3MHz / Sweep=AUTO
  - Average detection: RBW=1MHz; VBW=1/T / Sweep=AUTO (Duty cycle is less than 98%)
  - > Average detection: RBW=1MHz; VBW=3M / Sweep=AUTO
  - > Other procedures refer to clause 7.2.



#### • Quasi-Peak Measurements below 1GHz

- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. Span was set greater than 1MHz
- 3. RBW = as shown in the table above
- 4. Detector = CISPR quasi-peak
- 5. Sweep time = auto couple
- 6. Trace was allowed to stabilize

#### • Peak Measurements above 1GHz

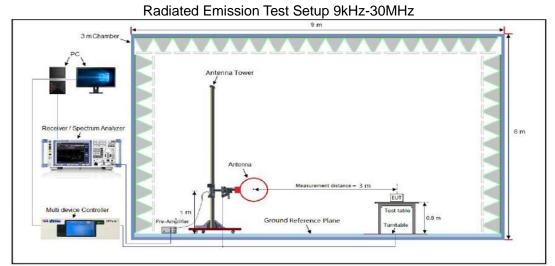
- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW = 3MHz
- 4. Detector = peak
- 5. Sweep time = auto couple
- 6. Trace mode = max hold
- 7. Trace was allowed to stabilize

#### • Average Measurements above 1GHz

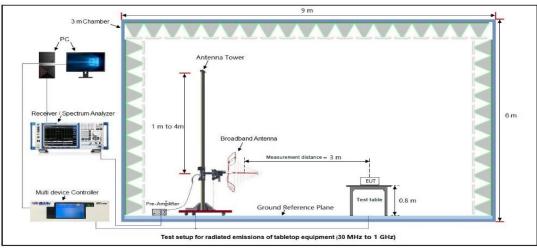
- 1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
- 2. RBW = 1MHz
- 3. VBW ≥ [3 × RBW]
- 4. Detector = Power averaging (rms)
- 5. Averaging type = power (i.e., rms)
- 6. Sweep time = auto
- 7. Perform a trace average of at least 100 traces.
- 8. The applicable correction factor is [10\*log (1 / D)], where D is the duty cycle. The factor had been edited in the "Input Correction" of the Spectrum Analyzer.



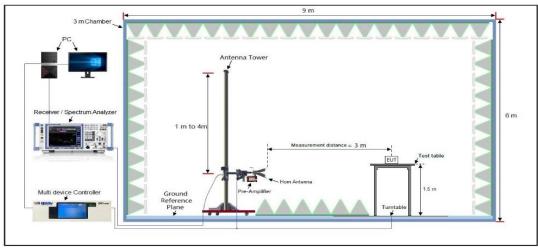
#### 8.3 Measurement Setup (Block Diagram of Configuration)



Radiated Emission Test Setup 30MHz-1000MHz



Radiated Emission Test Setup Above 1000MHz



Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

 Attestation of Global Compliance(Shenzhen)Co., Ltd

 Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd

 Tel: +86-755 2523 4088
 E-mail: agc@agccert.com



#### **8.4 Measurement Results**

#### **Field Strength of Fundamental**

EUT Name	lame Cycling Computer		Model Name	Model Name CS		CS500	
Temperature		22.6°C Relative Humidity			57.2%		
Pressure		960hPa		Test Voltage		DC 3.7V b	y battery
Test Mode		Mode 1		Antenna		Horizontal	/ Vertical
			Peal	k Value			
Frequency (MHz)		ured Level@3m (dBµV/m)	Correction Factor dB/m	Field Strength (dBµV/m)		it @3m βµV/m)	Polarity
2457		56.32	34.59	90.91	114		Horizontal
2457		56.31	34.59	90.90	114		Vertical
			Avera	ge Value			
Frequency (MHz)	Measured Level@3m (dBµV/m)		Correction Factor dB/m	Field Strength (dBµV/m)		it @3m βµV/m)	Polarity
2457		56.06	34.59	90.65		94	Horizontal
2457		56.03	34.59	90.62		94	Vertical

#### **RESULT: Pass**

Note: Corr. Factor= Antenna Factor (dB/m) + Cable Loss (dB)



#### Radiated Emission Below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20dB below the permissible value need not be reported.

			Radia	ted Emiss	ion Test Res	ults at 30MHz	z-1GHz			
EUT N	lame	Cycling	Cycling Computer				me	CS500		
Tempe	erature	22.6°C R			Relative H	Relative Humidity 57.2%				
Press	ure	960hPa	a			Test Voltage DC 3.7V by batte			y battery	
Test M	lode	Mode 1	1			Antenna	Antenna Polarity Horizontal			
	130				FCC Part 15	c				
	110 100 90 80 70 60 50 40 30 10 0 10 30M	- QP Limit QP Detector	- Horizontal PK	100M	Frequency[H	2]			f 16	
Final D	Data List									
NO.	Freq. [MHz]		Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	31.94		25.09	12.71	40.00	14.91	100	118	Horizontal	
2	71.71		26.23	14.19	40.00	13.77	100	58	Horizontal	
3	101.78	8	30.90	16.98	43.50	12.60	100	41	Horizontal	
4	141.55	5	27.21	16.13	43.50	16.29	100	127	Horizontal	
5	458.74	4	30.15	24.42	46.00	15.85	100	216	Horizontal	
6	859.35	5	36.73	29.99	46.00	9.27	100	3	Horizontal	



			Radia	ted Emiss	ion Test Res	ults at 30MHz	z-1GHz			
	lame	Cycl	ing Computer			Model Na	Model Name			
Temp	erature	<b>22.6℃</b>			Relative H	lumidity	57.2%			
Press	ure	960ł	۱Pa			Test Volta	ige	DC 3.7V b	y battery	
Test N	lode	Mod	e 1			Antenna	Antenna Polarity Vertical			
	130 120 110 90 80 (WV/Tgp) 90 80 80 40 30 40 10 0 -10 30M	- QP Limit		100M	FCC Part 150				16	
Final I	Data List									
NO.	Freq [MHz		Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity	
1	32.9 <sup>2</sup>	1	26.06	12.41	40.00	13.94	100	359	Vertical	
2	70.74	4	32.25	14.45	40.00	7.75	100	311	Vertical	
3	97.9		32.07	16.44	43.50	11.43	100	205	Vertical	
4	461.6	5	29.62	24.36	46.00	16.38	100	46	Vertical	
5	618.7	9	31.30	25.79	46.00	14.70	100	116	Vertical	
6	863.2	3	35.91	29.90	46.00	10.09	100	38	Vertical	

## **RESULT: Pass**

Note: 1. Factor=Antenna Factor + Cable loss, Margin=Measurement-Limit.



EUT Name	Cycling Co	Cycling Computer		Mode	el Name	CS500		
Temperature	<b>22.6</b> ℃			Relat	ive Humidity	57.2%		
Pressure	960hPa			Test V	Voltage	DC 3.7V	DC 3.7V by battery	
Fest Mode	Mode 1	Mode 1		Antei	nna Polarity	Horizont	al	
Frequency	Meter Reading	Factor	Emission	n Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV	//m)	(dBµV/m)	(dB)	value Type	
4914.000	47.95	0.08	48.0	3	74	-25.97	peak	
4914.000	38.42	0.08	38.5	5	54	-15.5	AVG	
7371.000	42.16	2.21	44.3	57	74	-29.63	peak	
7371.000	31.35	2.21	33.5	6	54	-20.44	AVG	
Remark: Factor = Anter	nna Factor + Cab	le Loss - Pre-	amplifier					
		10 2033 - 1 10-	ampiner.					
	Cycling Co			Mode	el Name	CS500		
EUT Name					el Name ive Humidity	CS500 57.2%		
EUT Name Temperature	Cycling Co			Relat		57.2%	by battery	
EUT Name Femperature Pressure	Cycling Co 22.6℃			Relat	ive Humidity	57.2%	by battery	
EUT Name Temperature Pressure Test Mode	Cycling Co 22.6℃ 960hPa Mode 1	mputer		Relat Test V Anter	ive Humidity Voltage nna Polarity	57.2% DC 3.7V Vertical	by battery	
EUT Name Temperature Pressure Test Mode	Cycling Co 22.6℃ 960hPa Mode 1 Meter Reading	mputer Factor	Emission	Relat Test V Anter	ive Humidity Voltage nna Polarity	57.2% DC 3.7V Vertical	by battery Value Type	
EUT Name Temperature Pressure Test Mode Frequency (MHz)	Cycling Co 22.6°C 960hPa Mode 1 Meter Reading (dBµV)	mputer Factor (dB)	Emission (dBµV	Relat Test V Anter	ive Humidity Voltage nna Polarity Limits (dBµV/m)	57.2% DC 3.7V Vertical Margin (dB)	- Value Type	
EUT Name Temperature Pressure Test Mode Frequency (MHz) 4914.000	Cycling Co           22.6 °C           960hPa           Mode 1           Meter Reading           (dBµV)           47.65	Factor (dB) 0.08	Emission (dBµV 47.7	Relat Test Anter Level (m)	ive Humidity Voltage nna Polarity Limits (dBµV/m) 74	57.2% DC 3.7V Vertical Margin (dB) -26.27	- Value Type peak	
EUT Name Temperature Pressure Test Mode Frequency (MHz) 4914.000 4914.000	Cycling Co 22.6℃ 960hPa Mode 1 Meter Reading (dBµV) 47.65 38.42	Factor (dB) 0.08 0.08	Emission (dBµV 47.7 38.5	Relat Test Anter Level (/m) 3 5	ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54	57.2% DC 3.7V Vertical Margin (dB) -26.27 -15.5	Value Type peak AVG	
EUT Name emperature Pressure est Mode Frequency (MHz) 4914.000 4914.000 7371.000	Cycling Co           22.6°C           960hPa           Mode 1           Meter Reading           (dBµV)           47.65           38.42           42.16	Factor (dB) 0.08 0.08 2.21	Emission (dBµV 47.7 38.5 44.3	Relat Test	ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54 74	57.2% DC 3.7V Vertical Margin (dB) -26.27 -15.5 -29.63	Value Type peak AVG peak	
EUT Name Femperature Pressure Fest Mode Frequency (MHz) 4914.000 4914.000	Cycling Co 22.6℃ 960hPa Mode 1 Meter Reading (dBµV) 47.65 38.42	Factor (dB) 0.08 0.08	Emission (dBµV 47.7 38.5	Relat Test	ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54	57.2% DC 3.7V Vertical Margin (dB) -26.27 -15.5	Value Type peak AVG	
EUT Name Femperature Pressure Fest Mode Frequency (MHz) 4914.000 4914.000 7371.000	Cycling Co           22.6°C           960hPa           Mode 1           Meter Reading           (dBµV)           47.65           38.42           42.16	Factor (dB) 0.08 0.08 2.21	Emission (dBµV 47.7 38.5 44.3	Relat Test	ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54 74	57.2% DC 3.7V Vertical Margin (dB) -26.27 -15.5 -29.63	Value Type peak AVG peak	
UT Name emperature ressure fest Mode Frequency (MHz) 4914.000 4914.000 7371.000 7371.000 Remark:	Cycling Co           22.6°C           960hPa           Mode 1           Meter Reading           (dBµV)           47.65           38.42           42.16	Factor (dB) 0.08 0.08 2.21 2.21	Emission (dBµV 47.7 38.5 44.3 33.4	Relat Test	ive Humidity Voltage nna Polarity Limits (dBµV/m) 74 54 74	57.2% DC 3.7V Vertical Margin (dB) -26.27 -15.5 -29.63	Value Type peak AVG peak	

#### **Radiated Emissions Test Results for Above 1GHz**

## **RESULT: Pass**

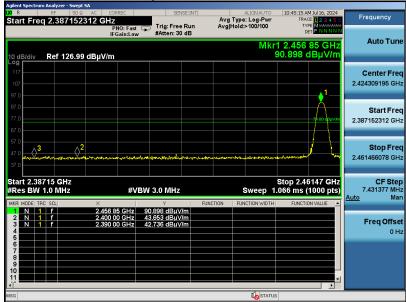
Note:

- 1. The amplitude of other spurious emissions from 1G to 25 GHz which are attenuated more than 20 dB below the permissible value need not be reported.
- 2. Factor = Antenna Factor + Cable loss Pre-amplifier gain, Margin = Emission Level-Limit.
- 3. The "Factor" value can be calculated automatically by software of measurement system.

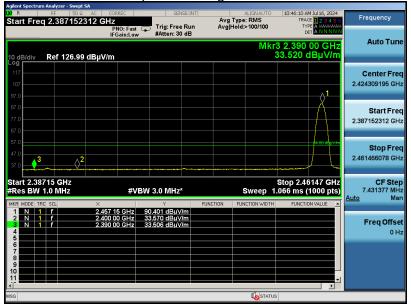


Band Edge	Emission	Test Results f	for Restricted Bands
Bana Eago		rootroodito	

EUT Name	Cycling Computer	Model Name	CS500
Temperature	<b>26</b> ℃	Relative Humidity	60%
Pressure	960hPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Antenna Polarity	Horizontal



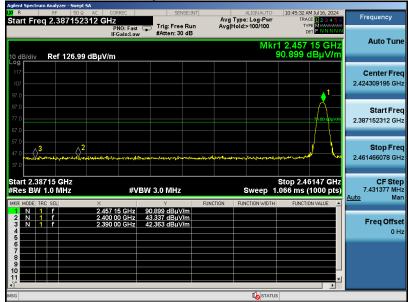
Test Graph for Average Measurement



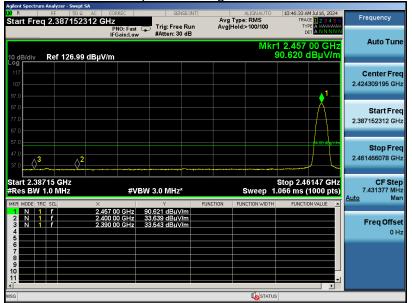
#### **RESULT: Pass**



EUT Name	Cycling Computer	Model Name	CS500
Temperature	<b>26</b> ℃	Relative Humidity	60%
Pressure	960hPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Antenna Polarity	Vertical



Test Graph for Average Measurement

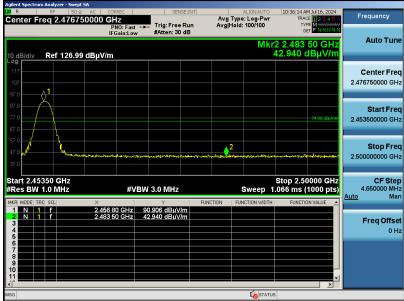


#### **RESULT: Pass**

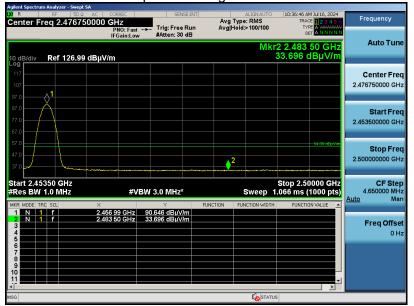


Band Edge Emission Test Results for Restrict	cted Bands
--	------------

EUT Name	Cycling Computer	Model Name	CS500
Temperature	<b>26°</b> C	Relative Humidity	60%
Pressure	960hPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Antenna Polarity	Horizontal



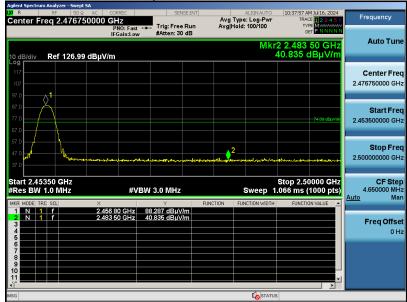
Test Graph for Average Measurement



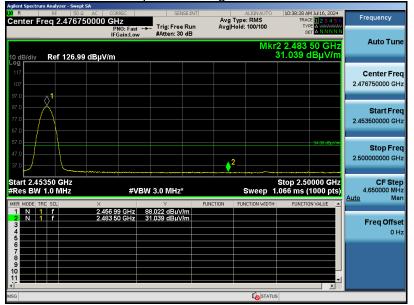
#### **RESULT: Pass**



EUT Name	Cycling Computer	Model Name	CS500
Temperature	<b>26</b> ℃	Relative Humidity	60%
Pressure	960hPa	Test Voltage	DC 3.7V by battery
Test Mode	Mode 1	Antenna Polarity	Vertical



Test Graph for Average Measurement



#### **RESULT: Pass**



Note:

- 1) Factor=Antenna Factor + Cable loss Amplifier gain. Field Strength=Factor + Reading level
- 2) The factor had been edited in the "Input Correction" of the Spectrum Analyzer. So the Amplitude of test plots is equal to Reading level plus the Factor in dB. Use the A dB(μV) to represent the Amplitude. Use the F dB(μV/m) to represent the Field Strength. So A=F.



## 9. AC Power Line Conducted Emission

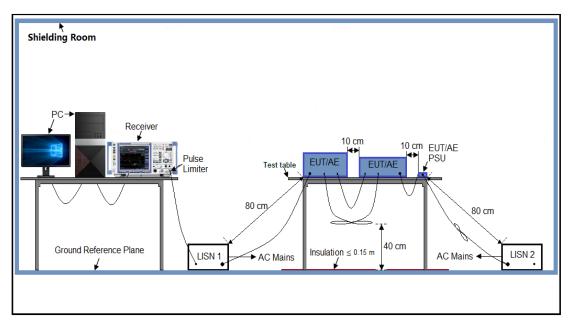
#### 9.1 Measurement Limit

<b>F</b> rancisco (	Maximum RF Line Voltage				
Frequency	Q.P. (dBµV)	Average (dBµV)			
150kHz~500kHz	66-56	56-46			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

Note:

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

#### 9.2 Measurement Setup (Block Diagram of Configuration)





## 9.3 Preliminary Procedure of Line Conducted Emission Test

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received DC 5V power from adapter which received AC120V/60Hz power from a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

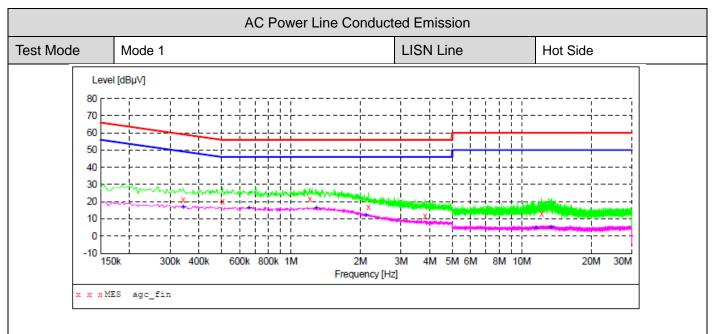
Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

#### 9.4 Final Procedure of Line Conducted Emission Test

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less – 2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case condition(s) was reported on the Summary Data page.

#### 9.5 Measurement Resul





#### MEASUREMENT RESULT: "agc\_fin"

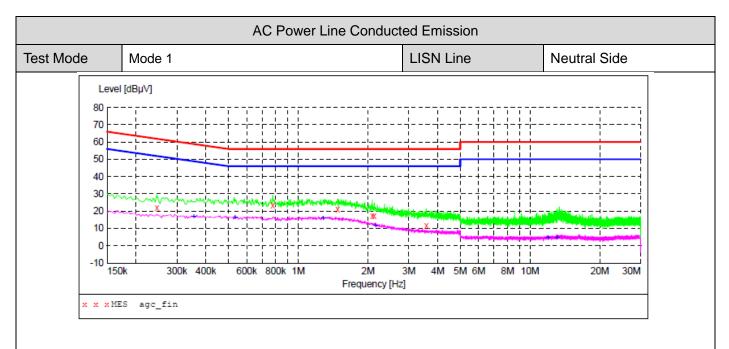
2024/7/9 23:54 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.342000 0.506000 1.206000 2.170000 3.810000 12.186000	20.90 20.10 21.30 16.90 11.50 13.10	6.1 6.2 6.3 6.3 6.8	59 56 56 56 56 60	38.3 35.9 34.7 39.1 44.5 46.9	QP QP QP	L1 L1 L1 L1 L1 L1

#### MEASUREMENT RESULT: "agc\_fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.342000	16.90	6.1	49	32.3	AV	L1
0.658000	16.10	6.2	46	29.9	AV	ь1
1.290000	16.10	6.2	46	29.9	AV	ь1
2.122000	12.00	6.2	46	34.0	AV	L1
11.526000	4.80	6.7	50	45.2	AV	L1
13.390000	5.20	6.8	50	44.8	AV	L1

#### **RESULT: Pass**





#### MEASUREMENT RESULT: "agc\_fin"

2024/7/9 23:57 Frequency MHz		Transd dB	Limit dBµV	Margin dB	Detector	Line
0.246000 0.778000 1.482000 2.090000 2.130000 3.574000	21.90 23.20 21.10 17.40 17.20 11.70	6.1 6.2 6.2 6.2 6.2 6.3	62 56 56 56 56 56		QP QP	N N N N N

#### MEASUREMENT RESULT: "agc fin2"

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Detector	Line
0.354000	16.90	6.1	49	32.0	AV	N
0.534000	16.20	6.2	46	29.8	AV	N
1.282000	16.00	6.2	46	30.0	VA	N
2.154000	11.70	6.2	46	34.3	AV	N
11.966000	4.40	6.7	50	45.6	AV	N
13.062000	4.50	6.8	50	45.5	AV	N

## **RESULT: PASS**

Any report having not been signed by authorized approver, or having been altered without authorization, or having not been stamped by the "Dedicated Testing/Inspection Stamp" is deemed to be invalid. Copying or excerpting portion of, or altering the content of the report is not permitted without the written authorization of AGC. The test results presented in the report apply only to the tested sample. Any objections to report issued by AGC should be submitted to AGC within 15days after the issuance of the test report. Further enquiry of validity or verification of the test report should be addressed to AGC by agc01@agccert.com.

Attestation of Global Compliance(Shenzhen)Co., Ltd Attestation of Global Compliance(Shenzhen)Std & Tech Co., Ltd Tel: +86-755 2523 4088 E-mail: agc@agccert.com Web: http://www.agccert.com/



## Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC01040240701AP02

# Appendix II: Photographs of Test EUT

Refer to the Report No.: AGC01040240701AP03

-----End of Report-----



## Conditions of Issuance of Test Reports

1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").

2. Any report issued by Company as a result of this application for testing services (the "Report") shall be issued in confidence to the Clients and the Report will be strictly treated as such by the Company. It may not be reproduced either in its entirety or in part and it may not be used for advertising or other unauthorized purposes without the written consent of the Company. The Clients to whom the Report is issued may, however, show or send it, or a certified copy thereof prepared by the Company to its customer, supplier or other persons directly concerned. The Company will not, without the consent of the Clients, enter into any discussion or correspondence with any third party concerning the contents of the Report, unless required by the relevant governmental authorities, laws or court orders.

3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.

4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.

5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.

6. The Company will not be liable for or accept responsibility for any loss or damage however arising from the use of information contained in any of its Reports or in any communication whatsoever about its said tests or investigations.

7. Clients wishing to use the Report in court proceedings or arbitration shall inform the Company to that effect prior to submitting the sample for testing.

8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.

9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.