EMC Testing of Jinhua QUEENE Electric Technology co.,LTD

China

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Pedelec
TDN08Z-FAT,TDN00Z-FAT

In accordance with EN 15194

Prepared for: Jinhua QUEENE Electric Technology co.,LTD
3rd Floor, A6 Building, No. 3188 South 2nd Ring West Road Qiubin Street
Wucheng District 321000 Jinhua City, People's Republic of China

COMMERCIAL-IN-CONFIDENCE

Date: 5/9/2018
Report Number: 4830018232400

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Approved By	Jun Bao	2018.5.9	Jun Bao
Prepared By	Ji Da	2018.5.9	Ji Da

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service control rules.

EXECUTIVE SUMMARY
A sample of this product was tested and found to be in compliance with EN 15194:2009/A1:2011.

TÜV SÜD Certification and Testing (China) Co., Ltd.
No.10 Huaxia Road (M), Dongting, Wuxi, 214100 P.R.China
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ID Number: EMC_WUX_F_25.43E
Revision:5.1
Effective:2017-06-22

Contents

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	5/9/2018

1.2 Introduction

The information contained in this report is intended to show verification of the EMC Qualification Approval Testing of the requirements of the standards for the tests listed in Section 1.3.

Applicant	Jinhua QUEENE Electric Technology co.,LTD
address	3rd Floor, A6 Building, No. 3188 South 2nd Ring West Road Qiubin Street Wucheng District 321000 Jinhua City, People's Republic of China
Manufacturer	Jinhua QUEENE Electric Technology co.,LTD
address	3rd Floor, A6 Building, No. 3188 South 2nd Ring West Road Qiubin Street Wucheng District 321000 Jinhua City, People's Republic of China
Model Number(s)	TDN08Z-FAT,TDN00Z-FAT
Rated input voltage	DC 48V
Rated input power	250W
Number of Samples Tested	1
Test Specification	EN 15194:2009/A1:2011
Date of Receipt of EUT	19/04/2018
Start of Test	20/04/2018
Finish of Test	27/04/2018
Name of Engineer(s)	Ji da

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with EN 15194 is shown below.

Section	Specification	Clause	Test Description	Result	Comments/Base Standard
DC Powered / Battery Powered / Running					
2.1	EN 15194:2009/A1:2011	Annex C.1.2.2 & C.1.2.3	Radiated Disturbance	Pass	
2.2	EN 15194:2009/A1:2011	Annex C.8	Electrostatic discharge immunity test	Pass	EN 61000-4-2
2.3	EN 15194:2009/A1:2011	Annex C.1.2.4	Vehicle immunity to electromagnetic radiation	Pass	ISO 11451-1 ISO 11451-2

1.4 Product Information

1.4.1 Technical Description

The Equipment Under Test (EUT) is pedelec. Electrically power assisted cycle, equipped with pedals and an auxiliary electric motor, which cannot be propelled exclusively by means of this auxiliary electric motor.

Two models of sample have the same electrical structure and electronic components, only model TDN08Z-FAT was chosen to test.

1.4.2 EUT Port/Cable Identification

Port	Max Cable Length specified	Usage	Type	Screened
DC Powered / Battery Powered				
--	--	--	--	no

1.4.3 Test Configuration

Configuration	Description
DC Powered / Battery Powered	48V

1.4.4 Modes of Operation

Mode	Description
Running	Apply a load in order to achieve 75% continuous rated power; 90% of the “start up assistance mode”; 90% of the design maximum assistance speed.
Power on	standstill mode.

1.4.5 Monitoring of Performance

The EUT works normally, there are no abnormal changes in the speed of the vehicle's drive wheels, there are no signs of operational deterioration which might mislead other road users and there are no other noticeable phenomena which could result in a deterioration in the direct control of the vehicle.

1.4.6 Performance Criteria

Vehicle immunity to electromagnetic radiation

There are no abnormal changes in the speed of the vehicle's drive wheels, there are no signs of operational deterioration which might mislead other road users and there are no other noticeable phenomena which could result in a deterioration in the direct control of the vehicle.

Electrostatic discharge immunity test

Performance criterion A: The apparatus shall continue to operate as intended during the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.

Performance criterion B: The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. During the test, degradation of performance is allowed, however no change of actual operating state or stored data is allowed to persist after test. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and from what the user may reasonable expect from the apparatus if used as intended.

Performance criterion C: Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instruction for use.

1.5 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.6 Test Location

TÜV SÜD Product Service conducted the following tests at TÜV SÜD Certification and Testing (China) Co., Ltd.

Address:

No. 10 Huaxia Road (M)
Dongting
Wuxi
Jiangsu Province
214100
China

Test Name	Name of Engineer(s)	Accreditation
DC Powered Running		
Radiated Disturbance	Ji da	CNAS
Electrostatic discharge immunity test	Ji da	CNAS
Vehicle immunity to electromagnetic radiation	Ji da	CNAS

2 Test Details

2.1 Radiated Disturbance

2.1.1 Specification Reference

EN 15194:2009/A1:2011, Clause Annex C.1.2.2 & C.1.2.3

2.1.2 Equipment Under Test

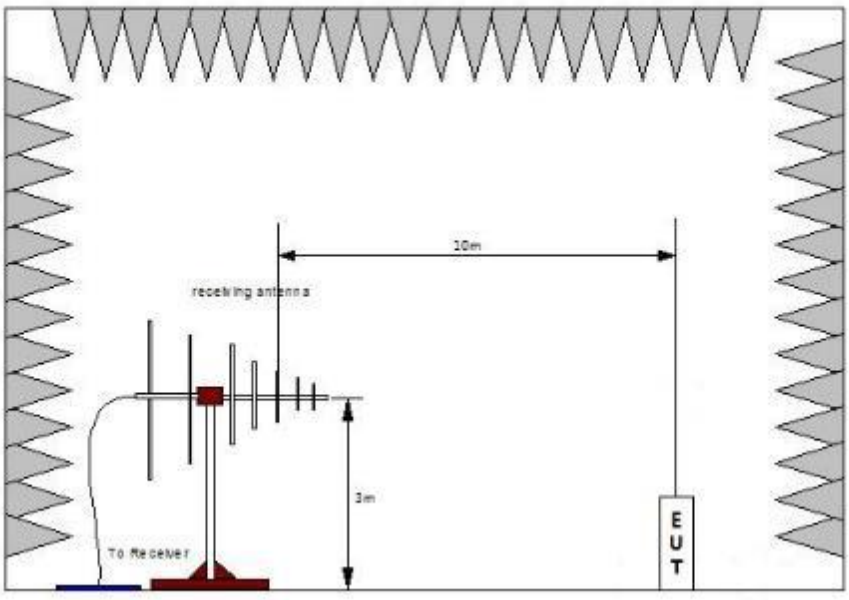
TDN08Z-FAT

2.1.3 Date of Test

20/04/2018

2.1.4 Test Method

The EUT was set up in a semi-anechoic chamber on a remotely controlled turntable and placed on a reference ground plane, the center of the antenna shall be 3m ± 0.05m above the ground.
A prescan of the EUT emissions profile was made while varying the antenna-to-EUT azimuth and antenna-to-EUT polarization using a peak detector; measurements were taken at a 10m distance.
The EUT was then formally measured using a Quasi-Peak detector to measure broad-band electromagnetic radiation and using an average-value detector to measure narrow-band electromagnetic radiation.
Apply a load in order to test at 75% ± 10% of the continuous rated declared by the manufacturer.



2.1.5 Environmental Conditions

Ambient Temperature	25.0 °C
Relative Humidity	55.0 %
Atmospheric Pressure	1025.0 mbar

2.1.6 Specification Limits

Electromagnetic radiation emissions reference limits					
Value	Band-width	Antenna distance	Equation for L [dB(µV/m)] within f[MHz]		
			30…75	75…400	400…1000
Mean value	Narrow-band	10±0.2m	24	24+15,13log(f/75)	35
Quasi-peak	Broad-band	10±0.2m	34	24+15,13log(f/75)	45

2.1.7 Test Results

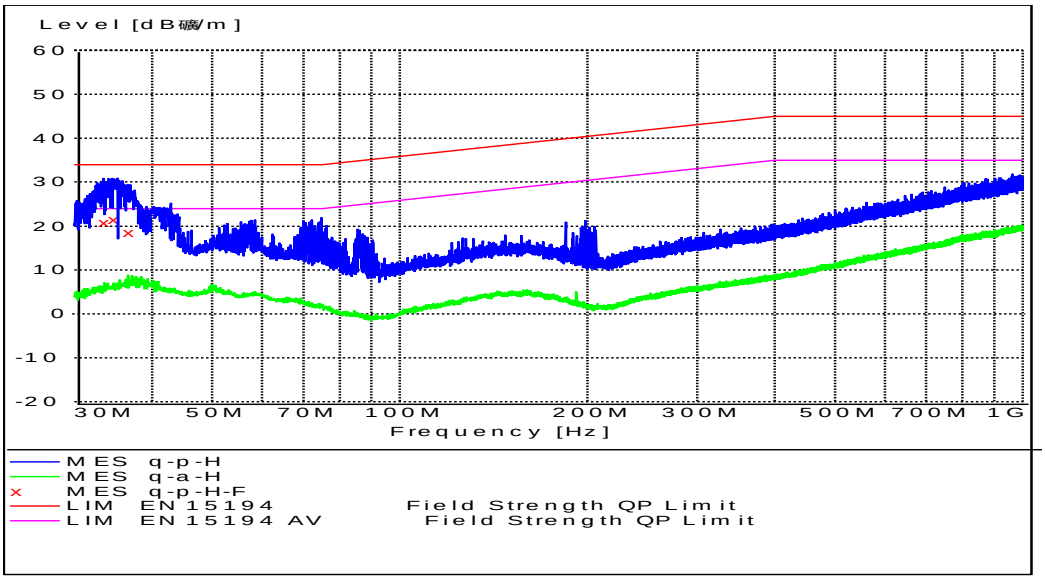
Results for Configuration and Mode: DC Powered / Battery Powered / Running

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

Apply a load in order to achieve 75% continuous rated power.

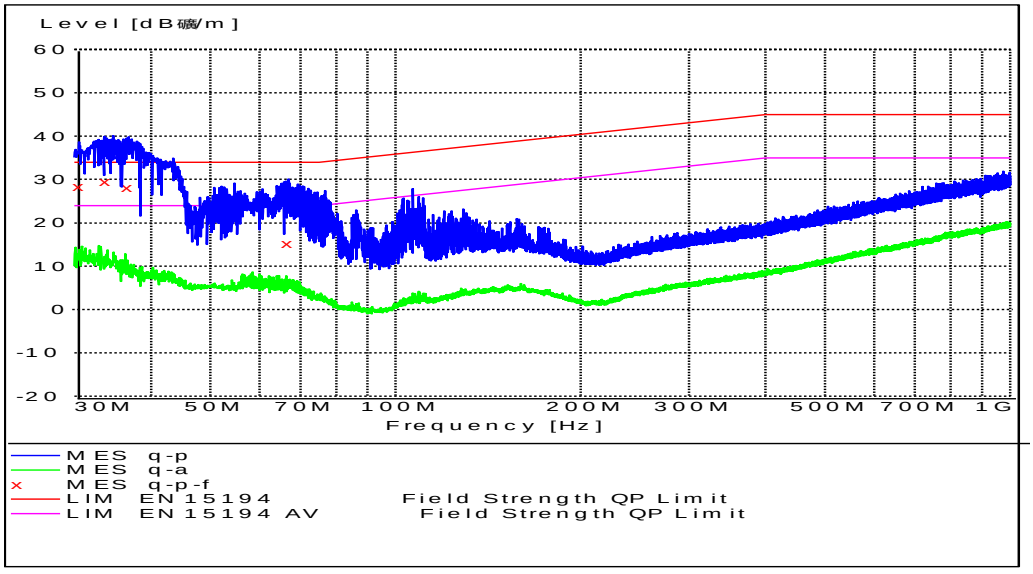
Frequency Range of Test: 30 MHz to 1 GHz



Graphical Results - Horizontal Polarity

MEASUREMENT RESULT: "q-p-H-F"

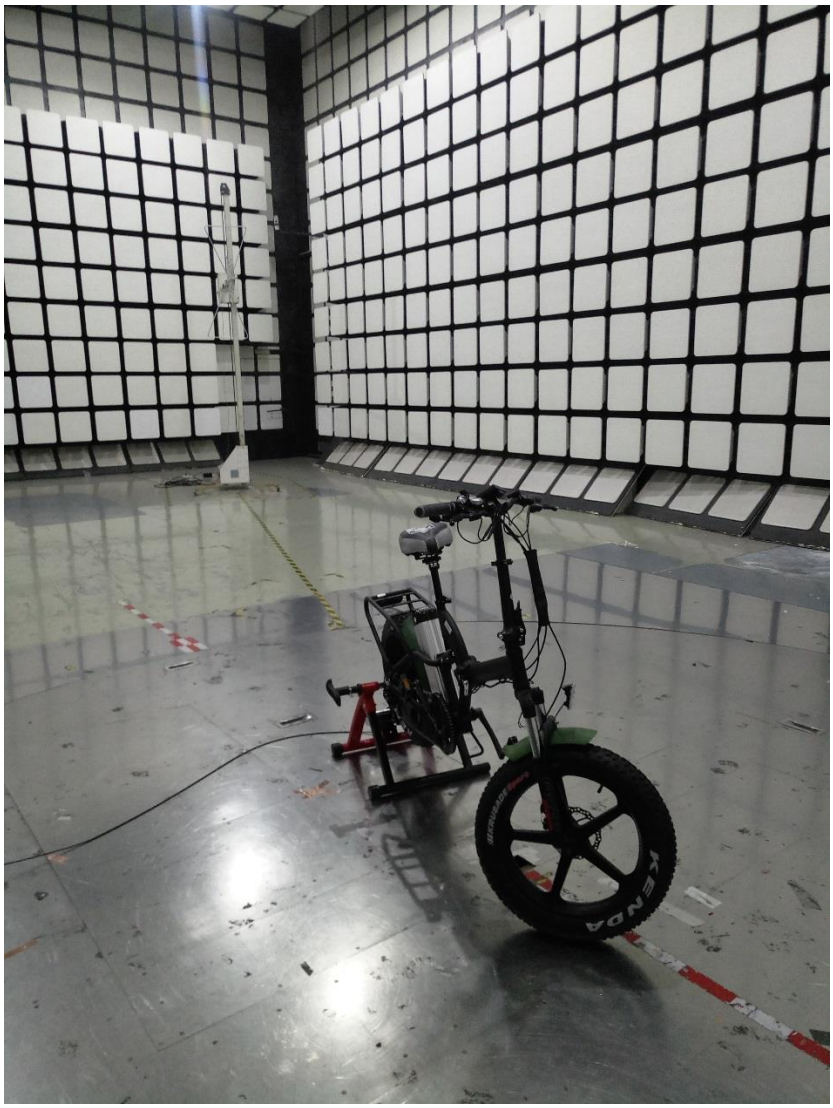
Frequency MHz	Level dBµV/m
33.500000	20.79
34.800000	21.43
36.750000	18.61



Graphical Results - Vertical Polarity

MEASUREMENT RESULT: "q-p-f"

Frequency MHz	Level dBµV/m
30.500000	28.29
33.750000	29.40
36.650000	28.19
66.550000	15.05



Test Setup

2.1.8 Test Location

This test was carried out in 10m anechoic chamber.

2.2 Electrostatic discharge immunity test

2.2.1 Specification Reference

EN 15194:2009/A1:2011, Clause Annex C.8

2.2.2 Equipment Under Test

TDN08Z-FAT

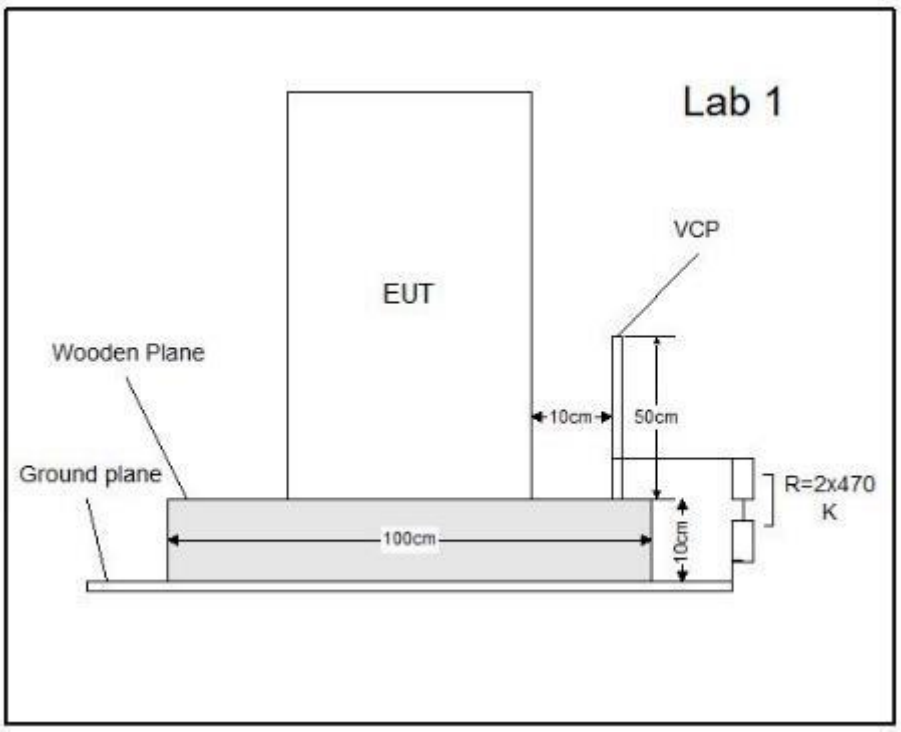
2.2.3 Date of Test

24/04/2018

2.2.4 Test Method

Using the air discharge method for non-metallic parts, contact discharge method for metallic parts with both vertical and horizontal couple plane discharge methods for the sides of the equipment under test, the required electrostatic discharge voltage levels in both voltage polarities were applied at the detailed pulse repartition rate.

During this testing any anomalies in the equipment under tests performance was recorded.



2.2.5 Environmental Conditions

Ambient Temperature	25.0 °C
Relative Humidity	55.0 %
Atmospheric Pressure	1024.0 mbar

2.2.6 Specification Limits

Required Test Levels				Performance Criteria
Discharge type	Discharge Level (kV)		Number of discharges per location (each polarity)	
	Positive	Negative		
Air – Direct	2, 4 and 8	2, 4 and 8	<10>	B
Contact – Direct	2 and 4	2 and 4	<10>	B
Contact – Indirect	2 and 4	2 and 4	<10>	B

2.2.7 Test Results

Results for Configuration and Mode: DC Powered / Battery Powered / Running

Performance assessment of the EUT made during this test: Pass.

Detailed results are shown below.

ID	Test Point	Discharge	Results (Pass PC A)									
			2kV		4kV		6kV		8kV		15kV	
			+	-	+	-	+	-	+	-	+	-
	each location on the surface touchable by hand / VCP	Contact	✓	✓	✓	✓						
	each location on the surface untouchable by hand	Air	✓	✓	✓	✓			✓	✓		

✓ The EUT's performance was not impacted when the ESD was applied.

Test Setup

2.2.8 Test Location

This test was carried out in shielded room A.

2.3 Vehicle immunity to electromagnetic radiation

2.3.1 Specification Reference

EN 15194:2009/A1:2011, Clause Annex C.1.2.4

2.3.2 Equipment Under Test

TDN08Z-FAT

2.3.3 Date of Test

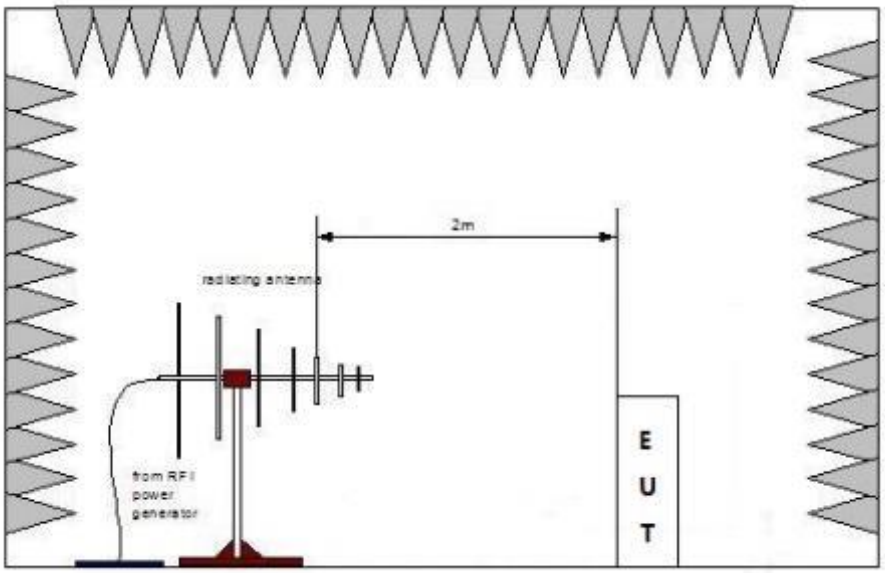
25/04/2018

2.3.4 Test Method

The equipment under test including associated cabling was configured, floor standing; with a pre-calibrated semi anechoic chamber.

All four sides of the equipment under test were subjected to the required RF field strength, modulated as described, swept over the frequency range of test with the antenna positioned in both horizontal and vertical polarizations.

During this testing any anomalies in the equipment under tests performance was recorded.



2.3.5 Environmental Conditions

Ambient Temperature	25.0 °C
Relative Humidity	55.0 %
Atmospheric Pressure	1023.0 mbar

2.3.6 Specification Limits

Required Test Levels					
Frequency Range (MHz)	Level (V/m)	Modulation	Step Size (%)	Dwell (s)	Performance Criteria
20 to 2000	30	AM (80 %, 1 kHz, sine wave)	1	2	A
Supplementary information: EUT powered at one of the Nominal input voltages and frequencies					

2.3.7 Test Results

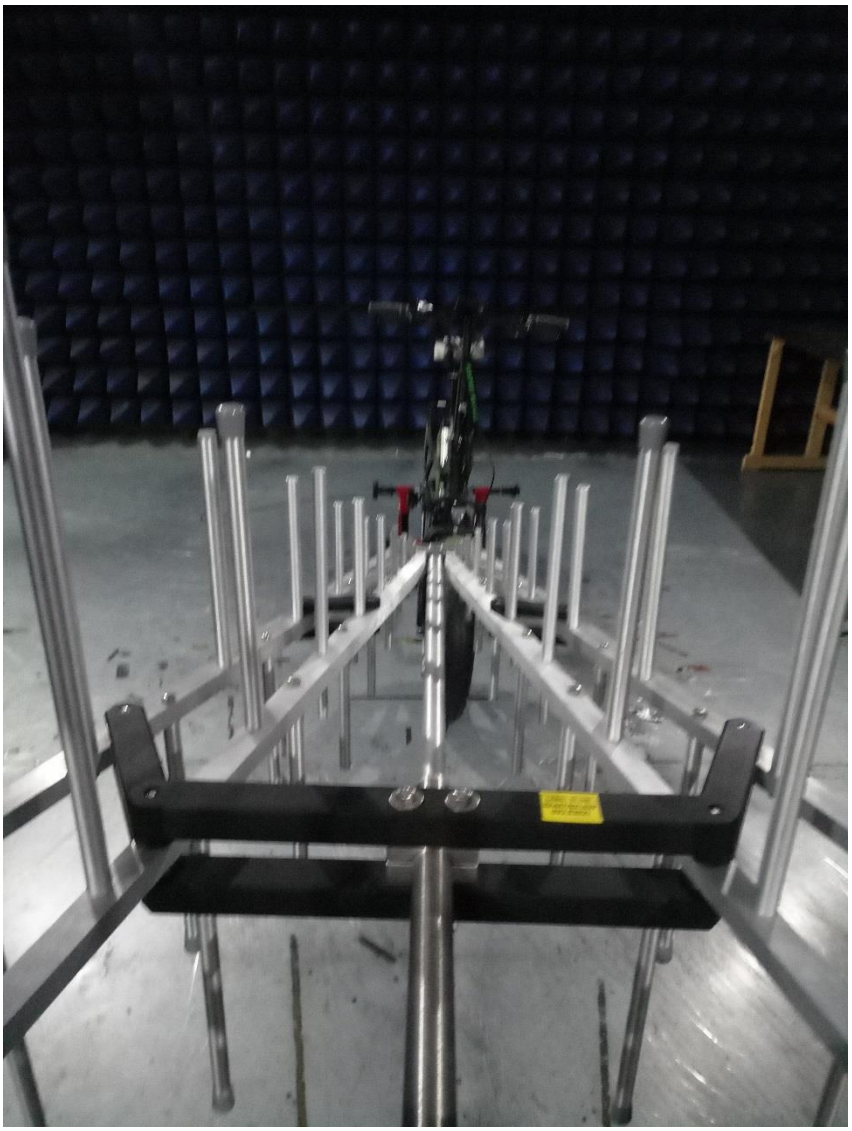
Results for Configuration and Mode: DC Powered / Battery Powered / Running / Power on

Performance assessment of the EUT made during this test: *Pass.*

Detailed results are shown below.

Running, 90% of the design maximum assistance speed.
Running, 90% of the “start up assistance mode”.
Power on, standstill mode.

Tabulated Results for RF Electromagnetic Field 20-2000 MHz						
Side of the equipment under test	Antenna polarization	Test Level	step	Dwell Time	modulation	Result
Front, Rear, Left, Right	Horizontal and Vertical	30V/m	1%	2 s	1KHZ SINE 80% AM	Pass PC A



Test Setup

2.3.8 Test Location

This test was carried out in 3m anechoic chamber.

3 Test Equipment Information

3.1 General Test Equipment Used

Instrument	Manufacturer	Type No	TE No	Calibration Date	Calibration Due
Radiated Emissions (Electric Field)					
EMI Test Receiver	Rohde & Schwarz	ESIB 7	487/630408	2018.1.7	2019.1.6
Bilog Antenna	Schwarzbeck	VULB9168	487/620214	2017.5.27	2019.5.26
Semi-anechoic Chamber	TDK	10m	487/770201	--	--
Immunity					
ESD Simulator	HAEFELY	ONYX 30	487/751520	2017.10.23	2018.10.22
Signal Generator	Rohde & Schwarz	SMB 100A	487/391120	2018.1.7	2019.1.6
Power Meter	Rohde & Schwarz	NRP2	487/741156	2018.1.7	2019.1.6
Coupler	Amplifier Research	DC7144A	487/571117	2018.1.7	2019.1.6
Coupler	Amplifier Research	DC6180A	487/571116	2018.1.7	2019.1.6
Power Amplifier	TESEQ	CBA1G-500	487/400908	2018.1.7	2019.1.6
Power Amplifier	TESEQ	CBA3G-100	487/400909	2018.1.7	2019.1.6
Antenna	Schwarzbeck	STLP 9128Ds	487/621432	--	--

4 Measurement Uncertainty

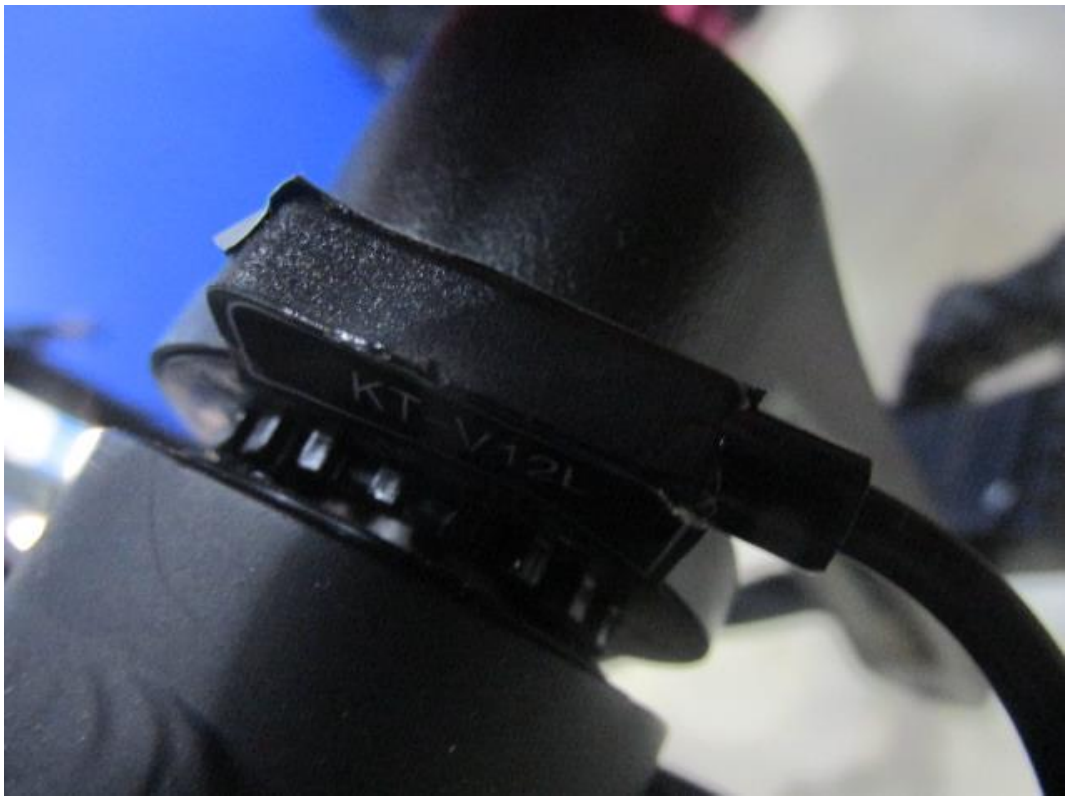
For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Radiated Disturbance	30MHz to 1GHz, ±3.88dB
Electrostatic discharge immunity test	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2
Vehicle immunity to electromagnetic radiation	The test was applied using proprietary equipment that meets the requirements of ISO 11451-1 & ISO 11451-2

5 Photographs

China


Suzhou City KUNTENG Electro
co.,LTD




TEKTRO


ELSSS
TKWL


XE
24/36/48VDC


HL1900


Spanninga Bicycle
Components(Foshan) Co.,Ltd


Spanninga Bicycle
Components(Foshan) Co.,Ltd

China


RL1900


Suzhou City KUNTENG Electronic
co.,LTD
Controller for brushless motor
Model: KT36/48ZWSRD-JQY04
Rated voltage: DC36V/48V
Rated current: 9A
Low voltage protection: DC30/40±0.5V
Maximum current: 18±1A
Speed set: 1-4.2V
Brake input:Low-Level

China


Part No: Motor
Manufacurer: Jinhua QUEENE Electric
Technology co.,LTD
Model: QYXADXD02
Technical data: 48Vd.c 250W


108X
ABS


QY-EV048016N02-001
BATTERY
Jinhua QUEENE Electric Technology co.,LTD
QYLDCYY002-48V15.6AH