SAFETY TEST REPORT

TEST REPORT
EN 15194 Cycles - Electrically power assisted cycles - EPAC Bicycles

Report reference No. ..... : MICEZ-2018012202-LVD MICEZ-20180102202-EMC

Tested by (+signature) ..... : Thomas Peng .....see cover page.....

Approved by (+ signature) ... : Eric Yan .....see cover page.....

Date of issue ..... : January 3, 2018

Testing laboratory

Name..... : Shanghai MICEZ Equipment Testing & Technical Co., LTD

Address..... : Room 402, Huifeng Business No.6111 Zhongchun Road, Minhang District, Shanghai, China

Test location ..... : (Same as above)

Client

Name..... : Yiwu Longdeng Bicycle Co., Ltd.

Address..... : No.41, Old Street, Niansanli Street, Yiwu City, Zhejiang Province, China.

Test specification

Standard ..... : EN 15194:2009+A1:2011

Test procedure..... : CE-LVD

Procedure deviation..... : N.A.

Non-standard test method.. : N.A.

Test Report Form No.....: EN15194_1C

TRF originator ..... : MICEZ

Master TRF ..... : 2014-06

Test item	
Description	Lithium battery electric bicycle
Model No	FA-EM001，FA-EM002，FA-EM003，FA-EM004，FA-EM005，FA-EM006，FA-EM007，FA-EM008，FA-EM009，FA-EM010，FA-EM011，FA-EM012，FA-EM013，FA-EM014，FA-EM015，FA-EM016，FA-EM017，FA-EM018，FA-EM019，FA-EM020，FA-EM021，FA-EM022，FA-EM023，FA-EM024，FA-EM025，FA-EM026，FA-EM027，FA-EM028，FA-EM029,FA-EM030，FA-EM031,FA-EM032，FA-EM033，FA-EM034； FB-EM001，FB-EM002，FB-EM003，，FB-EM004，FB-EM005，FB-EM006，FB-EM007，FB-EM008，FB-EM009，FB-EM010，FB-EM011，FB-EM012，FB-EM013，FB-EM014，FB-EM015，FB-EM016，FB-EM017，FB-EM018，FB-EM019，FB-EM020，FB-EM021，FB-EM022，FB-EM023，FB-EM024，FB-EM025，FB-EM026，FB-EM027，FB-EM028，FB-EM029，FB-EM030，FB-EM031，FB-EM032，FB-EM033，FB-EM034，FB-EM035，FB-EM036；
Trade Mark	/
Manufacturer	Yiwu Longdeng Bicycle Co., Ltd.
Address	No.41, Old Street, Niansanli Street, Yiwu City, Zhejiang Province, China.
Rating(s)	36V 150W 36V 250W 36V 350W 48V 500W

Test item particulars:		
Equipment mobility	:	movable hand-held stationary fixed
Connection to the mains	:	pluggable equipment direct plug-in permanent connection for building-in not directly connected to the mains
Operating condition.....	:	continuous short-time intermittent
Over voltage category	:	OVC I OVC II OVC III OVC IV
Mains supply tolerance (%)	: /	
Tested for IT power systems	:	Yes No
IT testing, phase-phase voltage (V)	: N/A	
Class of equipment	:	Class I Class II Class III Not classified
Pollution degree	:	PD 2 PD 3
IP protection class	: IP20	

Possible test case verdicts:

- test case does not apply to the test object ..... : N/A (Not applicable)
- test object does meet the requirement ..... : P (Pass)

- test object does not meet the requirement ..... : F (Fail)

Testing:

Date of receipt of test item..... : 28 01, 2018

Date(s) of performance of tests ..... : 25 01, 2018

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

General product information / Summary of testing:

- The ELECTRIC BICYCLE is movable equipment supplied by inner rechargeable Li-ion battery, the battery can be charged by 42V ⎓ 2A from external power adapter with 100-240V~50/60Hz input. So the whole system is regarded as class III appliance.

-Max. temperature is considered as 25ºC for no declaration from the manufacturer.

List of Attachments (including a total number of pages in each attachment):

Annex I: Electro Magnetic Compatibility test result

Annex II: Photo documentation

Copy of marking plate: For modelElectric Bike

ELECTRIC BICYCLE

Model No.Lithium battery electric bicycle

Rating: -

Max loading: 110kg

Max speed: 25km/h

SARL REVOE

The product has been tested according to standard IEC 60950-1:2005 (2nd Edition) / EN 60950-1:2006 and those deviations taken into account of

☒ CENELEC common modifications		☐ United Kingdom	☐	☐
☐ Finland	☐ Denmark	☐ Ireland	☐	☐
☐ Sweden	☐ Germany	☐ Spain	☐	☐
☐ Norway	☐ Switzerland	☐	☐	☐

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
4	Requirements		P
4.1	General		P
	Electrically power-assisted bicycles shall comply with Clause 4,5 and 6 of the European Standard EN 14764:2005 in addition to the specific requirements in Clause 4.2 of the standard.	Tests of clause 4.2 of this standard see below, tests for EN 14764: 2005 see mechanical parts for detail.	P
4.2	EPAC specific additional requirements		P
4.2.1	Electric circuit		P
	The electrical control system shall be designed so that, should it malfunction in a hazardous manner, it shall switch off power to the electric motor.	Battery has key lock system	P
	If symbols are used, their meaning shall be described in the instructions for use. Their function is one described in ISO 2575, their design shall be in accordance to that standard.	Warning symbol in battery charger and user manual	P
4.2.2	Batteries		P
4.2.2.1	Requirements		P
	EPAC and pack of batteries shall be designed in order to avoid risk of fire, mechanical deterioration resulting from abnormal use. Compliance is checked by the test described in 4.2.2.2.	See 4.2.2.2	P
	During the test the EPAC and the batteries shall not emit flames, molten metal or poisonous ignitable gas in hazardous amounts and any enclosure shall show no damage that could impair compliance with this European Standard.	No flames, molten metal or poisonous ignitable gas occur	P
	Safety and compatibility of the combination battery. charger combination shall be ensured, according to the manufacturer’s specifications.	Battery charger together with the battery tested and pass	P
	The battery terminals shall be protected against creating an accidental short circuit. Care shall be taken to ensure that the batteries are protected against overcharging. An appropriate overheating and short circuit protection device shall be fitted.	Internal protection provided for battery when short circuit and overcharging.	P
	Batteries and the charger unit shall be labelled in order to the able to check their compatibility.	Battery and battery charger provided marking plate on enclosure with CE Marking	P
4.2.2.2	Test method	See table 4.2.2 for detail	P
	1) Battery terminals are short – circuited with the batteries in a fully charged condition.		P
	2) Motor terminals are short-circuited; all commands are in ON position, whilst the batteries are fully charged.		P
	3) The EPAC is operated with the electric motor or		P

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
	drive system locked up so as to fully discharge the battery or until the system stops.		
	4) The battery is charged for double the recommended charging period or for 24 hours depending upon which is the longest period.		P
4.2.3	Electric cables and connections		P
4.2.3.3	Wiring		P
4.2.3.1	Requirements		P
	Cable and plug temperature shall be lower than that specified by the manufacturer of the cables and plugs. There shall be no corrosion on plug pins and no damage to cable and plug insulation.		P
4.2.3.2	Test method		P
	Discharge the fully charged EPAC battery to the discharging limit specified by the EPAC or ESA manufacturer at the maximum current allowable by the system and record it, giving consideration to the electric motor and /or the controller and / or the battery controller. Measure the cable and plug temperatures and ensure, by examination, that there is no deterioration of the insulation on either assembly.	Normal discharging current for EPAC recorded less than 4A which is lower than 10.4A declared by the battery manufacturer. Temperature rise refer table 4.2 for detail	P
4.2.3.3	Wiring		P
	a) Wire ways shall be smooth and free from sharp edges.	Bushing or protection tube provided for wiring.	P
	b) Wire shall be protected so that they do not come into contact with burrs, cooling fins or similar sharp edges that may cause damage to their insulation. Holes in metal through which insulated wires pass shall have smooth well-rounded surfaces or be provided with bushing.	See above	P
	C) Wiring shall be effectively prevented from coming into contact with moving parts.	Cable for battery and controller well protected inside one box below bicycle frame. Wiring for motor also prevented from coming into contact spoke of wheel	P
	Separate parts of the EPAC that can move in normal use or during user maintenance relative to each other, shall not cause undue stress to electrical connections and internal conductors, including those providing earthing continuity.		P
	Compliance with a), b), c) shall be checked by inspection.		P
	d) If an open coil spring is used, it shall be	No coil spring used	N/A

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
	correctly installed and insulated. Flexible metallic tubes shall not cause damage to the insulation of the conductors contained within them..		
	e) the movable part is moved backwards and forwards, so that the conductor is flexed through the largest angle permitted by its construction.	No such parts	N/A
	For conductors that are flexed in normal use, flex movable part for 10,000 cycles at a test frequency of 0,5 Hz.		N/A
	For conductors that are flexed during user maintenance, flex the movable part for 100 cycles at the same frequency at (20±5) ^{o}C.		N/A
	The wiring and its connections shall withstand the electrical strength test. The test voltage expressed in V shall be equal to (500+2.Vr) for 2 min and applied between live parts and other metal parts only.	DC 572V tested between input terminal of controller and metal frame for 2 minutes.	P
	f) The insulation of internal wiring shall withstand the electrical stress likely to occur in normal use.		P
	g) In case of integrated battery charger, electric safety of battery charger applied.	Not integrated battery charger	N/A
4.2.3.4	Power cables and conduits		P
	Conduit entries, cable entries and knock-outs Shall be constructed or located so that the introduction of the conduit or cable does not reduce the protection measures adopted by the manufacturer.	Bushing and protection tube used for internal wiring.	P
4.2.3.5	External and internal electrical connections	Has complied with	P
	Electrical connection shall comply with IEC 60364-5-52: 2001, Clauses 526.1 and 526.2.		P
4.2.3.6	Moisture resistance		P
	The EPAC are subjected to the test of IEC60529 as follow: IPX4 appliances as described in Clause 14.2.4.a.	IPX4 tested and pass 360 ^{O}C, 12s, 10min	P
4.2.3.7	Mechanical strength		P
	EPAC shall have adequate mechanical strength and be constructed to withstand such rough handling that may be expected in normal use.	See below	P
	Applying impacts to the battery pack mounted on the EPAC by means of the spring hammer as specified in IEC 6006802-75. The battery pack is rigidly supported and three impacts are applied to every point of the enclosure that is likely to be weak with an impact energy of (0,7±0,05)J. After the test the battery pack shall show no damage that could impair compliance with this European Standard.	3 times impact conducted on enclosure of battery pack with 0.7J hammer, no danger show after tests	P

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
	Detachable battery packs are submitted to free fall at a height of 0,90 meter in three different positions.	0.9 meter free fall tested for battery pack, no visible damage observed.	P
	After the test the battery pack shall show no damage that could lead to emission of dangerous substances (gas or liquid) ignition, fire or overheating.		P
4.2.4	Power management		P
4.2.4.1	Requirements		P
	When tested by the method described in 4.2.4.2 the recordings shall show that:	Assistance provided when pedals forward, pedal can no move backward.	P
	a)Assistance shall be provided only when the cyclist pedals forward. This requirement has to be checked according to the test methods described in 4.3.4.3.3 a);	See table 4.2.4.1 for detail	P
	b)Assistance shall be cut off when the cyclist stops pedalling forward such the cut off distance does not exceed 5m with the use of brake lever cut off switch of 2m without the use of brake lever cut off switch. This requirement has to be checked according to the test methods described in 4.2.4.2.2. b);		P
	c)The output of assistance shall be progressively reduced and finally cut off as the vehicle reaches the maximum assistance speed as designed. This requirement has to be checked according to the test methods described in 4.2.4.2;	See clause 4.2.4.2	P
	d)The assistance shall be progressively and smoothly managed.		P
4.2.4.2	Test method-Electric motor management		P
4.2.4.2.1	Test conditions		P
	a)The test may be performed either on a test track, a test bench or on a stand which keeps the motor driven wheel free of the ground	EPAC tested on road. Speed computer has a accuracy of 1%	P
	b)The test track shall be according to EN 14764:2005, Clause 4.6.8.5.1.1.		P
	c)The time-measuring device shall have an accuracy of ±2%.		P
	d)The ambient temperature shall be between 5℃ and 35℃	22℃	P
	e)Maximum wind speed shall not exceed 3m/s.	2.4m/s	P
	f)The battery shall be fully charged according to the manufacturer’s instructions.	Has been full charged	P

Clause	Requirement + Test	Result - Remark	Verdict
4.2.4.2.2	The procedure		P
	a)Check that there is no electric motor assistance when pedalling backwards. The test to ensure the compliance to this clause shall be adapted to the technology used. For example, pedal backwards no torque is delivered on the driving wheel.	No electric assistance when pedal move backwards.	P
	b)Worst case conditions of gear ratio and speed shall be applied.	Six gear ratio provided by EPAC, worst case tested on 6^{th} ratio.	P
	c)Worst condition for speed is defined as 90% of cut off speed.	90% of the declared cut off speed 25 km/h X0.9=22.5 km/h	P
	d)Measure the distance travelled from cessation of pedalling and actuating the switch brake simultaneously (if any) to no power corresponding to no load current point provided by the electric motor by using: -Speed versus time measurement, - Direct or indirect torque versus distance measurement (e.g. motor current) - Or any other appropriate method.	See table 4.2.4.1 for detail	P
	e)carry out the test ten times and then average.	Ten times test are carried out and made an average, see table 4.2.4.1 for detail.	P
4.2.4.3	Start up assistance mode	No such mode	N/A
4.2.4.3.1	Requirements		N/A
	EPAC can be equipped with a start up assistance mode up to 6 km/h designed speed or lower values as specified by the manufacturer. Unauthorized use shall be prevented.		N/A
4.2.4.3.2	Test Method		N/A
	Test conditions		N/A
	a)The test may be performed either on a test track, a test bench or on a stand that keeps the motor driven wheel free of the ground.		N/A
	b)the speed-measuring device shall have the following characteristics:		N/A
	- Accuracy : ±2		N/A
	- Resolution: 0,1 km/h		N/A
	c)The ambient temperature shall be between 5℃and 35℃		N/A
	a) Maximum wind speed: 3 m/s.		N/A
	b) The battery shall be fully charged according to the manufacturer’s instructions.		N/A

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
4.2.4.3.2.2	Test procedure		N/A
	a)Pre-condition the EPAC by running it for 5 min at 80% of the maximum assistance speed as declared by the manufacturer, then stop.	4.6km/h for 5 min	N/A
	b)Activate the start up assistance mode and verify that the speed increase u to 6 km/h maximum designed speed or lower value.		N/A
	c)Verify that speed is going down to 0 km/h when start up assistance mode is deactivated and current drops to a value equal to or less than no load current point when free rolling.		N/A
	d)Activate the start up assistance mode.		N/A
	e)Verify that speed decreases when the start up assistance mode is activated and the current drops to a value equal to or less than no load current point.		N/A
	f)Activate the start up assistance mode and maintain it for 1 min.		N/A
	g)Verify that speed is equal to or less than 6 km/h.		N/A
4.2.5	Electro Magnetic Compatibility	See EMC parts for detail	P
	The EPAC is not intended to be used while charging, for integrated charger the whole EPAC plus integrated charger shall be tested.	Has been tested	P
	The following European standards apply for battery charger: EN55014-1, EN55014-2,EN61000-3-2, EN61000-3-3.	Has complied with	P
4.2.6	Maximum speed for which the electric motor give assistance		P
4.2.6.1	Requirements		P
	The maximum speed for which the electric motor gives assistance may differ by ±5% of the speed indicated on the label described within Clause 5 when determined according to the test method described in 4.2.6.2, from 25 km/h or lower values as specified by the manufacturer.	Maximum cut off speed 25 km/h declared by manufacturer	P
	During a production conformity checked, the manxiumum speed may differ by±10% from the above – mentioned determined value.	24.2 km/h cut off speed measured	P
4.2.6.2	Test method		P
4.2.6.2.1	Test conditions		P
	a)The test may be performed either on a test track, a test bench or on a stand that keeps the motor driven wheel free of the ground.	EPAC tested on bicycle stand keeps wheel free of the ground	P

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
	b)The speed-measuring device shall have the following characteristics:		P
	- Accuracy : ±2		P
	- Resolution: 0,1 km/h		P
	c)The ambient temperature shall be between 5℃ and 35℃.	Test temperature: 22℃	P
	d)Maximum wind speed: 3m/s		P
	e)The battery shall be fully charged according to the manufacturer instructions.	Battery was fully charged	P
4.2.6.2.2	Test procedure	EPAC tested on road	P
	Any appropriate method for checking for this requirement is acceptable; one solution is to measure the cut-off speed, another being to measure the torque output. The following example describes the cut-off speed test.	Cut off speed measured directly by bicycle meter.	P
	a)Pre-condition the EPAC by running it for 5 min at 80% of the maximum assistance speed as declared by the manufacturer.	20 km/h speed reached and precondition for 5 minutes	P
	b)Record continuously the current and note the speed at which the current drops to a value equal to or less than “ no load current point “.	Current meter monitored in output of battery record the no load current point which was measure previously 50mA	P
	c)Whilst pedalling, ride steadily to reach a speed equal to 1,25 times(if possible by design) the maximum assistance speed as declared by the manufacturer.	When speed reach 24.6 km/h motor give no assistance and current monitored in current clamp drop to no load current point	P
	d)Verify the noted value in b) is equal to or less than the maximum speed declared by the manufacturer.	24.6 km/h cut off speed measured	P
4.2.7	Maximum power measurement		P
4.2.7.1	Measurement at the engine shaft	Measurement done at the engine shaft	P
	The maximum continuous rated power shall be measured according to EN 60034-1 when the motor reaches its thermal equilibrium as specified by the manufacturer.	Maximum continuous rated Power is 250W declared by the manufacturer tested acc. to EN 60034-1.	P
	In circumstance where the power is measured directly at the shaft of the electronic motor, the result of the measurement shall be decreased by 1,10 to consider the measurement uncertainty and then by 1,05 to include for example the transmission losses, unless the real values of these losses are determined.		P
4.2.7.2	Alternative method	Not used	N/A

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict
	Annex D gives guidance on how to measure the power at the wheel.		N/A
5	Marking, labelling		P
	In addition to the requirements of EN 14764, the EPAC shall be visibly and durably marked according to EN15194 as follows:		P
	- EPAC	EPAC	P
	- XX km/h	25km/h	P
	- XX W	250W	P
6.	Instruction for use		P
	In addition to the instructions required by the bicycles standard EN 14764, each EPAC shal be provide with a set of instructions containing information on:	Has been contained in user manual	P
	1)Concept and description of electric assistance; 2)Recommendation for washing; 3)Control and tell tales; 4)Specific EPAC recommendations for use; 5)Specific EPAC warnings; 6)Recommendation about battery charging and charger use as well as the importance of following the instruction contained on the label of the battery charger.		P

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict

4.2	TABLE: temperature rise measurements				P
	t1(℃)	22			-
	t2(℃)	22			-
	Test Voltage(V)	36V DC			-
	Input current for DC motor(A)	6.93			-
	Rated continuous Power on shaft	250W			-
	Winding temperature rise measurements:				p
	Insulation class	See below			-

Temperature rise dT of winding	R1( )	R2( )	dT(k)	Required dT(K)	Insulation class
DC Motor Winding (Yellow-Blue)	0.3326	0.4376	80.3	105.0	F

Temperature rise measurements			P
t1(℃)		24.0	
t2(℃)		25.0	
Temperature rise dT part/at:	tm ℃	Tc℃	Required Tmax℃
Enclosure of adaptor	25.8	40.7	70
Enclosure of battery unit -1	26.3	41.0	70
En closure of batter unit -3	26.6	41.2	70
Plastic enclosure of battery compartment inside	25.2	39.9	70
Appliance inlet connector	25.1	39.6	85
Fuse holder	26.7	40.4	85
DC connector	25.5	40.0	85

NOTE:
tm =measured temperature
tc=tm corrected (tm-tc+40℃ max. RATED ambient)
tmax=maximum permitted temperature

Clause	Requirement + Test	Result - Remark	Verdict

4.2.3.3	TABLE: Electric strength tests for wiring			P
Test voltage applied between:		Voltage shape (AC, DC impulse, surge)	Test Voltage (V)	Breakdown Yes/No
Input terminal of controller – metal frame		DC	572V	No
Supplementary information: 500+2×Vr for 2min, Vr is the rated voltage				

4.2.2	TABLE: Fault condition tests			P
	Ambient temperature(℃)		22.0	-
Fault No.	Fault	Supply voltage(V)	Test time	Observation
4.2.2-1)	Battery terminal S-C	36V DC	1s	Output voltage from 39.0V in normal condition decrease to 0V when terminal s- c, F20A fuse broken, battery recoverable after new fuse replaced. No hazard occur, no obvious temperature rise, no flame, molten metal or poisonous gas appear.
4.2.2-2)	Motor input(controller output) two terminals s-c	36V DC	10min	EPAC system stop, normal current of battery decrease from 3.70A to 0.05A, output of controller decrease to 0A when drive motor locked. No hazard occur, no obvious temperature rise, no flame, molten metal or poisonous gas appear.
4.2.2-2)	Motor input(controller output) all three terminals s-c	36V DC	1h	Normal current of battery decrease from 3.70A to 1.1A, output of controller s-c, mosfet in controller in overload condition and broken after 15min, excess temperature observed in aluminium case of controller. No flame, molten metal or poisonous gas appear. Controller not recoverable.
4.2.2-3)	Motor block	36V DC	10min	EPAC system stop, normal current of battery decrease from 3.70V to 0.05A, output of controller decrease to 0A when drive motor locked. No hazard occur, no obvious temperature rise no flame, molten metal or poisonous gas appear.
4.2.2-4)	Batter over charging	36V DC	2 times charging period or 2h	Battery charger turns from red to green after 5.5 hours charging, no hazard occur, no obvious temperature rise, no flame, molten metal of poisonous gas appear 24 hours overcharging.
Supplementary information: Note 1: Normal charging time for the battery charger is 4 hours, so test for 4.2.2-4) is 24 hours.				

EN 15194			
Clause	Requirement + Test	Result - Remark	Verdict

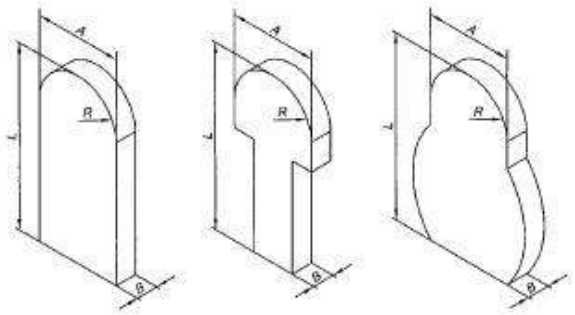
4.2.2/4.2.23	TABLE: Batteries				P
Is it possible to install the battery in a reverse polarity position?			No		P
	Rechargeable batteries				
	Charging		discharging		
	Meas. current	Manuf. Specs.	Meas. current	Manuf. Specs.	
Max. current during normal condition	1.92A	2.0A	5.70A	10.4A	
Test result				Verdict	
- Chemical leaks				P	
- Explosion of the battery				P	
- Emission of flame or expulsion of molten metal				P	
- Electric strength tests of equipment after completion of tests				P	

Supplementary information:
1. Charging current measured at AC 110-240V, 50Hz input of battery charger.
2. Discharging current measured at battery terminal with EPAC in normal ride condition average speed 20km/h. Start current of battery is about 15.0A for 2-3 seconds.

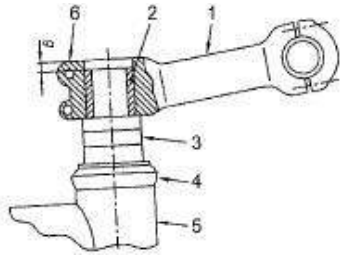
4.2.4.1	TABLE: Power Management	P
Test condition: Worst condition of the lowest gear ratio and 90% cut off speed as below, brake lever cut off switch for front wheel operate. Limit distance for this condition is 5 meters.		
t1=0.424s	S1=Vavr X t1=3.125X0.447s=1.39m	
T2=0.428s	S2=Vavr X t2=3.125X0.449s=1.40m	
T3=0.396s	S3=Vavr X t3=3.125X0.418s=1.35m	
T4=0.462s	S4=Vavr X t4=3.125X0.485s=1.52m	
T5=0.420s	S5=Vavr X t5=3.125X0.441s=1.38m	
T6=0.408s	S6=Vavr X t6=3.125X0.429s=1.34m	
T7=0.396s	S7=Vavr X t7=3.125X0.418s=1.31m	
T8=0.410s	S8=Vavr X t8=3.125X0.430s=1.34m	
T9=0.422s	S9=Vavr X t9=3.125X0.459s=1.43m	
t10=0.426s	S10=Vavr X t10=3.125X0.439s=1.39m	
Savr=(s1+S2+…+S9+s10)/10=1.39m		

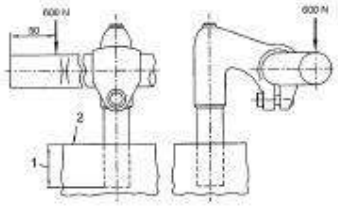
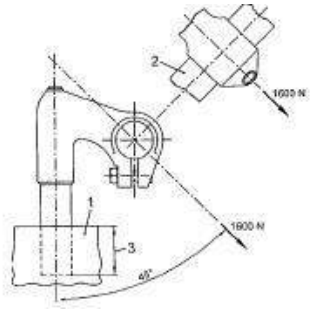
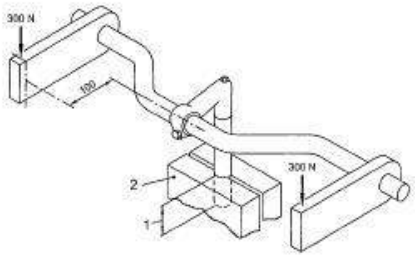
NOTE:
Vstart: Start speed of front wheel which is 90% cut off speed.
Vend: End speed of front wheel after brake lever cut off switch.
Vavr: Average speed of front wheel from start to end.
tn: Time between actuating the switch brake to no load current point monitored in current meter.
Sn: Cut off distance in one measure,
savr: average Cut Off distance in 10 times.

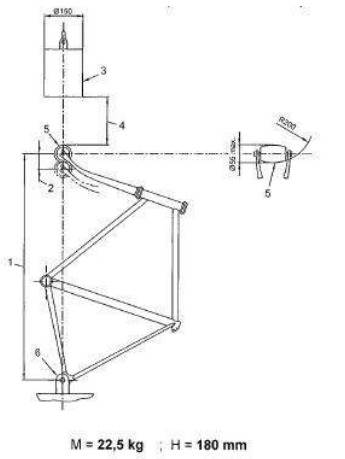
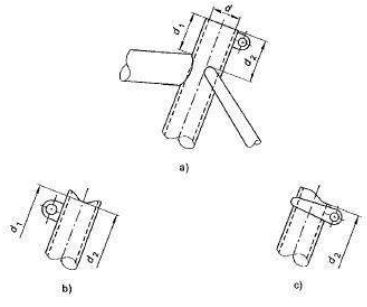
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
4.2	SHARP EDGES		P
	Exposed edges that could come into contact with rider's hands, legs, etc., during normal riding or normal handling and normal maintenance shall not be sharp.		P
4.3	SECURITY AND STRENGH OF SAFETY RELATED FASTENERS		P
4.3.1	SECERITY OF SCREWS		P
	Any screws used in the assembly of :		P
	- Suspension system		N/A
	- To attach generators		N/A
	- Brake mechanisms		P
	- Mud guard		P
	- Saddle to seat pillar		P
	Shall be provided with the suitable locking devices		P
4.3.2	MINIMUM FAILURE TORQUE		P
	The mimimum failure torque of bolted joints for the fastening of handles bars, handlebar-stems, bar-ends, seats and seat-pillars shall be 50% greater than the manufacturer's recommended tightening torque.		P
	- Stem-handlebar		P
	- Stem-head tube		P
	- Stem pillar clamp		N/A
	- Saddle-clamp		P
	- Front wheel		P
	- Rear wheel		P
4.3.3	Folding bicycles	Folding bicycle	P
	Folding mechanisms shall be designed so that the bicycle can be locked for use in a simple, stable, safe way and when folded no damage shall occur to any cables. No locking mechanism shall contact the wheels or tyres during riding, and it shall be impossible to unintentionally loosen or unlock the folding mechanisms during riding.	Meet all test requirements.	P
4.5	Protrusions Any rigid exposed protrusion longer than 8 mm except: a) The front gear-change mechanism at the chain-wheel;		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	b) The gear-change mechanism at the rear wheel c) The rim-brake mechanism at the front and rear wheels; d) A lamp-bracket fitted on the head-tube; e) Reflectors; f) Toe-clips and toe-straps: g) Clipless attachmen mechanism; h) Chain-wheels and spockets; i) Water bottle cage;		
4.5.1.1	Exposed protrusions		P
4.5.2	Shall terminate in a radius R, of not less than 6.3mm. Such protrusion shall have a major end dimension, A, not less than 12,7 and a minor dimension, B, not less than 3,2 mm  No protrusion in the top of a bicycle frame between the saddle and a point 300mm forward of the saddle, with the exception that control cables no greater than 6,4mm in diameter and cables clamps made from material no thicker than 4,8 mm may be attached to the top tube.		P
4.6	Brakes		P
4.6.1	Braking-systems		P
4.6.2	Hand-operated brakes		P
4.6.2.1	BRAKE LEVER POSITION	See Remark1	P
	The hand-brake levers for front and rear brakes shall be positioned according to the legislation or custom and practice of the country in which the bicycle is to be sold, and the bicycle manufacturer shall state in the users instruction manual which levers operate the front and read brakes.	The hand-brake levers have been positioned according to the custom of the country that bicycle is to be sold. And it is described in detail in users manual	P
	The hand-brake levers for front 7 rear brakes shall be positioned according to the legislation or custom and practice of the country in which the bicycle is to be sold, and the bicycle manufacturer shall state in the users instruction manual which levers operate the front and rear breaks.		P

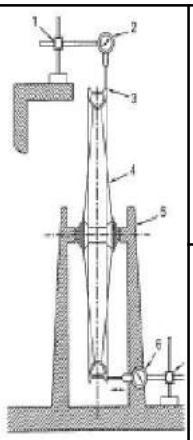
EN 14764					
Clause	Requirement + Test		Result - Remark		Verdict
4.6.2.2	BRAKE-LEVER GRIP DIMENSIONS				P
	The maximum grip dimension in the region intended for contact with the rider's fingers and the handle or any other covering present shall over a distance of not less than 40mm conform to the following: - 90 mm for minimum intended saddle height of 365mm or above - 75mm for minimum intended saddle height of 635 mm or less				P
4.6.3	Attachment of brakes assembly and cable requirements removal force		Removal force: 40N		P
4.6.4	Brake-block and brake-pad assemblies-security test				P
4.6.4.1	Requirement				P
4.6.4.2	Rocking test				P
4.6.5	Brake adjustment				P
4.6.6	Han-operated braking system-strength test				P
4.6.7	Back-pedal braking system				N/A
4.6.8	Braking performance				P
	Braking distance	Both	7m	5.34m	P
	Dry conditions	Rear only	15m	12.88m	
	Braking distance	Both	5m	4.03m	
	Wet conditions	Rear only	10m	6.89.m	
	Linearity		N/A		
	Ratio between wet and dry braking >40%		Complied		
4.6.9	Brakes-heat-resistance test				N/A
4.7	Steering				P
4.7.1	Handlebar – Dimensions				P
	The handlebar shall have an overall width between 350 and 1000mm unless national regulations dictate otherwise				P
	The vertical distance between the top of the handlebar grips, when assembled to the highest riding position according to the manufacturer's instructions and the seat surface of the saddle at its lowest position shall not exceed 400mm.				P
4.7.2	Handlebar grips and plugs				P
	The ends of the handlebar shall be fitted with				P

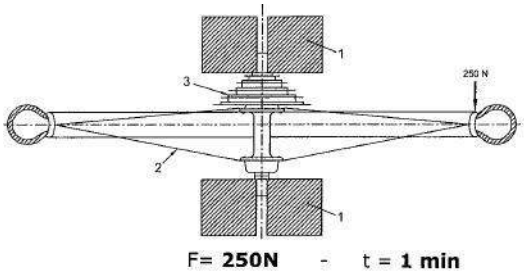
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	handgrips or end plugs. When tested by the method described in 4.7.2.2, the handgrips or plugs shall withstand a removal force of 70N		
4.7.3	HANDELBAR STEM – INSEPTION – DEPTH MARK OR STOP		P
	The handlebar-stem shall be provided with one of the two following alternative means of ensuring a safe insertion depth into the fork-stem:		P
	a) Shall contain a permanent, transverse mark, of length not less than the external diameter of the stem that clearly indicates the minimum insertion-depth of the handlebar- stem into the fork-stem.		P
	The insertion mark shall be located at a position not less than 2,5 times the external diameter of the handlebar-stem the bottom of the stem.		P
	And there shall be at least one stem diameter's length of contiguous, circumferential stem material below the mark.		P
	b) It shall incorporate a permanent stop to prevent it from being drawn out of the fork- stem such as to leave the insertion less than the amount specified in a above.		N/A
4.7.4	HANDLEBAR STEM – EXTENSION TO FORK STEM – CLAMPING The distance g shall not be greater than 5mm. The upper part of the fork-stem to which the stem-extension is clamped shall not be threaded. The dimension g shall also ensure that the proper adjustment of the steering system can be achieved. 		N/A
4.7.5	STEERING STABILITY		P
	The steering shall be free to turn through at least 60o either side of the straight ahead position and shall exhibit no tight spots, stiffness or slackness in the bearings when correctly adjusted.		P
	Steering stability a minimum of 25% of the total mass of the bicycle and rider shall act on the front wheel the rider is holing handlebar grips and sitting on the saddle, with the saddle and rider in their most rearward positions.	30%	P
4.7.6	Steering assembly-static strength and security		P

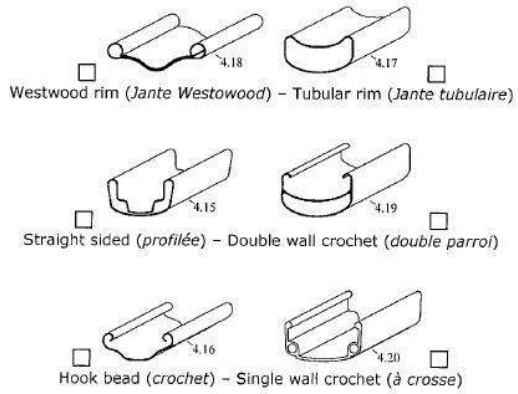
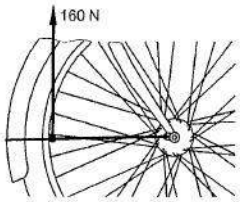
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	tests		
4.7.6.1	STEM: LATERAL BENDING TEST (intended of stem manufacturer who do not produce handlebars permanent set 10 mm		N/A
4.7.6.2	HANDLEBAR + STEM: LATERAL BENDING TEST When tested, there shall be no cracking or fracture of the handlebar, stem or clamp-bolt and the permanent set measured at the point of application of the test force shall no exceed 15mm. 	Permanent set: 12mm	P
4.7.6.3	STEM: FORWARD BENDING TEST		P
	When tested, there shall be no cracking or facture of the handlebar, stem or clamp-bolt and the permanent set measured at the point of application of the test force shall not exceed 10mm. 	Permanent set: 9 mm	P
4.7.6.4	HANDLEBAR TO HANDLEBAR STEM: TORTIONAL SECURITY TEST  Apply a torque of 60NM, about the center-line of the stem clamp, divide the torque equally by vertically, downward forces applied to both sides of the handlebar, maintain 1 minute. When tested by this method, there shall be no movements of the handlebar to the stem.		P

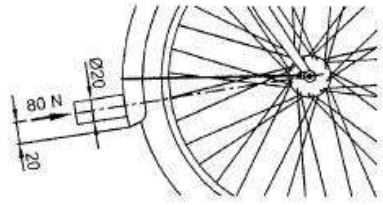
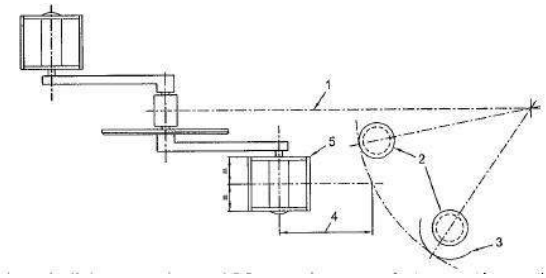
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
4.8.2	FRAME & FRONT FORK – IMPACT TEST (FALLING MASS)  M = **22,5 kg** ; H = **180 mm** The permanent set measured between the axes of the wheel axles shall not exceed the following values: 30 mm where a fork is fitted.	Permanent set:17 mm	P
4.8.3	FATIGUE TEST WITH PEDALLING FORCES All types of frame shall be subjected to this test. NB CYCLES=100,000; f=1000N Test frequency: 2.5 Hz When tested there shall be no visible cracks of fracture in ay part of the frame, and there shall be no separation of any part of the suspension system. For carbon-fibre frames, the peak deflection during the test at the point where the test forces are applied shall not increase by more than 20% of the initial values.		P
4.8.4	FATIGUE TEST WITH VERTICAL FORCES	See below	P
	All types of frames shall be subjected unless it has both a top-tube and seat-stays the upper parts of all of which join the seat-tube within a distance of twice the internal diameter of the seat-tube measured from the upper end of the seat tube and parallel to the seat tube axis. $d_1 \leq 2d$ $d_2 \leq 2d$  NB CYCLES = **50.000** ; F = **0 -> +1200 N**	The test has been done according to the requirement.	P

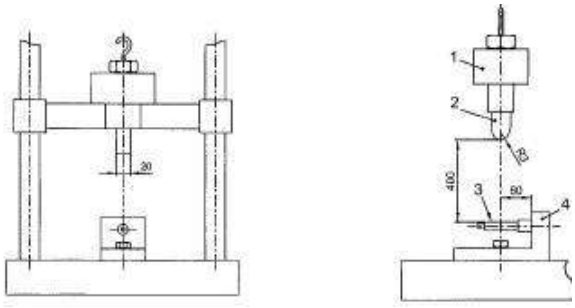
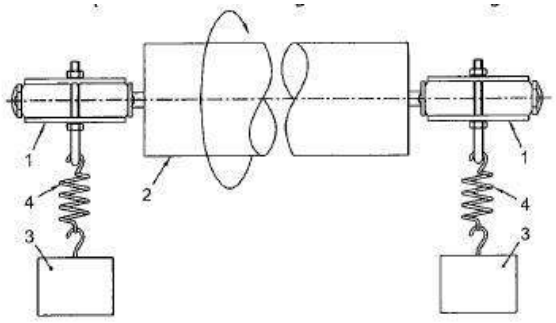
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	Test frequency: 3 Hz When tested there shall be no visible cracks of fracture in any part of the frame, and there shall be no separation of any part of the suspension system: For carbon-fibre frames, the peak deflection during test shall not increase by more than 20% of the initial values.		
4.9	Front Fork		P
4.9.2	MEANS OF LOCATION OF THE AXLE AND WHEEL RETENTION		P
	The slots or other means of location of the wheel-axle within the fork shall be such that the axle or cones are firmly abutting the top face of slots, the front wheel remains central within the fork.		P
4.9.3.1	SUSPENSION FORK – SPECIAL REQUIREMENTS		P
	The design shall be such that if the springs or dampers fail, the tyre shall not contact the crown of the fork nor shall the components of the fork separate.		P
4.9.3.3	SUSPENSION FORK – TYRE-CLEARANCE TEST		P
	Apply F=2800N to the wheel in a direction towards the fork-crown and parallel to the axis of the fork stem. Maintain 1 min. The tyre shall not contact to the crown of the fork.		P
4.9.3	SUSPENSION FORK-TENSIL TEST		P
	Apply a tensile force F=2300 N between the two drop-outs in a direction parallel to the axis of the fork stem maintain 1 min.		P
4.9.4	STATIC BENDING TEST F=100N ->1000N, T=1 MIN There shall be no fracture or visible cracks in any part of the fork and the permanent set shall not exceed: ■ 10 mm for rigid forks □ 5 mm for rigid forks		P
4.9.5	REARWARD IMPACT TEST		P
4.9.5.1	IF ASSEMBLED BY WELDING OR BRAZING(ONLY IF 4.8.2 IS NOT PERFORMED) Mass = 22,5 kg; Height = 180 mm There shall be no fracture and visible cracks and the permanent set shall not exceed 45 mm.	Permanent set: 17mm	P
4.9.5.2	IF ASSEMBLED BY PRESS-FITTING,		P

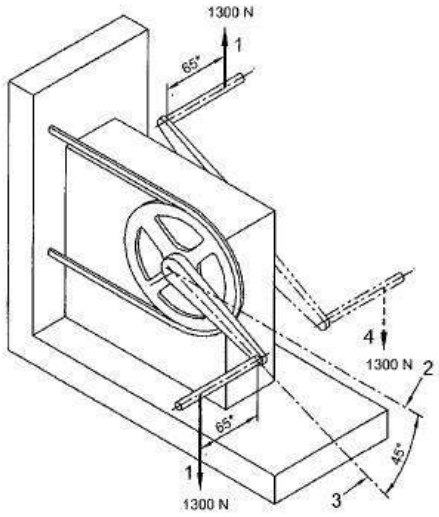
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	BONGDING, OR CLAMPING		
	1ST Step: Mass=22,5 kg; Height=180 mm There shall be no fracture and visible cracks and the permanent set shall not exceed 45mm.		P
	2nd step: Mass=22,5 kg; Height=600mm There shall be no fracture, no visible cracks, and no relative movement between the stem and crown, when subjected to a torque of 50Nm – 1min in any directions.		P
4.9.6	BENDING FATIGUE TEST Test Frequency: 3Hz F= +/- 450 N - 100000 CYCLES		P
4.9.7	FORK INTENDED FOR USE WITH HUB – OR DISC - BRAKES		P
4.9.7.2	STATIC BRAKE – TORQUE TEST Apply a vertical force F=100N to set the <zero> deflection, apply a parallel force F=1000N during 1 min then re-apply the 100N force to record the permanent set. There shall be no fracture and visible cracks and the permanent set shall not exceed 5mm		P
4.9.7.3	REPEATED BRAKE-TORQUE TEST F= 0 -> +600 N - 12000 CYCLES		P
4.10	Wheels and wheel/type assemblies		P
4.10.1	Rotational accuracy		P
4.10.1.2	WHEELS/TYRE ASSEMBLY – CONCENTRICITY TOLERANCE When measured perpendicular to the axle, the run- out shall no t exceed: ■ 1mm for wheels intended for rim-brakes □ 2mm for other kind	 brake Rront: 0.36 mm Rear: 0.42 mm	P
4.10.1.3	WHEELS/TYRE ASSEMBLY LATERAL TOLERANCE When measured parallel to the axle along the rim, the run-out shall not exceed: ■ 1mm for wheels intended for rim-brakes □ 2mm for other kind	brake Rront: 0.77 mm Rear: 0.69 mm	P
4.10.2	WHEELS/TYRE ASSEMBLY – CLEARANCE Alignment of the wheel assembly in a bicycle shall allow not less than 6 mm clearance between the tyre and any frame or fork element or a mudguard and its attached bolts.		P

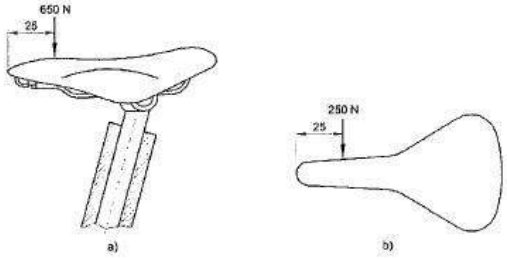
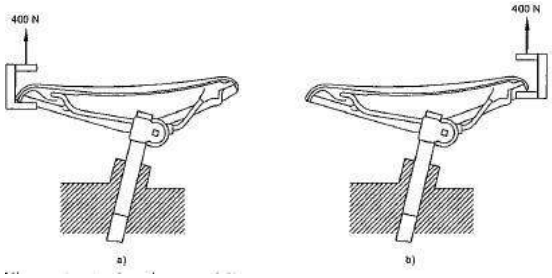
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
4.10.3	WHEEL/TYRE ASSEMBLY – STATIC STRENGH TEST  F= 250N - t = 1 min When tested, there shall be no failure and the permanent set shall not exceed 1.5 mm	Permanent set: 0.29 mm	P
4.10.4	Wheel retention		P
4.10.4.1	General		P
4.10.4.2	FRONT WHEEL RETERNTION – RETENTION DEVICE SECURED Apply a force F=2300N distributed symmetrically to both ends of the axle for a period of 2 min in the direction of the removal of the wheel. There shall be no relative motion between the axle and the front fork.		P
4.10.4.3	REAR WHEEL RETENTION – RETENTION DEVICE SECURED IDEM as 4.10.4.2 There shall be no relative motion between the axle and the frame.		P
4.10.4.4	FRONT WHEEL RETENTION – REYENTION DEVICE UNSECURED With the nuts are unscrewed by at least 360o and the brake system disconnected, apply a radially outwards force F=100N during 1 min. The wheel shall not detach from the fork		P
4.10.5	WHEELS-QUICK RELEASE DEVICES		N/A
4.11	RIMS, TYRES & TUBES		P
4.11.1	TYRE INFLATION PRESSURE The maximum inflation pressure recommended shall be permanently marked on the side wall of the tyre so as to be readily visible when the latter is assembled on the wheel.		P
4.11.2	TYRE & RIM COMPATILBILITY Tyres shall comply with ISO 5775-1, rims shall comply with teh requirements of ISO 5775-2 and they shall be compatible together	Tyre and rim comply to ISO 5775 The tyre was inflated up to 304kPa. The max. rated pressure is	P

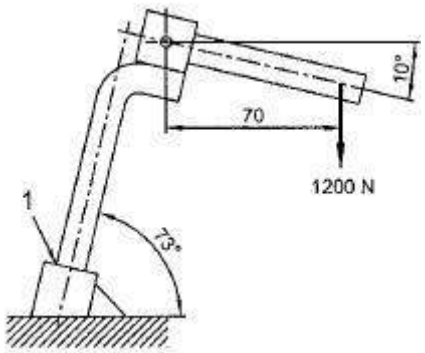
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
		276kPa After 5 min the tyre still remains intact on the rim.	
	According to ISO 5775-1 tyre shall have the proper markings: - Tyres used with straight sided (SS) or crochet rims(c): Tyre nominal size "-"Tyre nominal diameter - Tyres used with Hook bead (HB) rims: External diameter code "X" tyre nominal size code.		P
	When inflated to 110% of the maximum inflation pressure for a period of not less than 5 min, the tyre shall remain intact on the rim.		P
4.11.3	RIM-WEAR		P
	In the case where the rim forms part of a braking system, the manufacturer shall make the rider aware of the danger of failure due to wear by durable and legible marking on the rim, in an area not obscured by the tyre.		P
4.12	MUDGUARDS		P
	FRONT MUDGUARD STANGE 1: TANGENTIAL OBSTRUCTION  F= **160N** - Ø = **12 mm** - t = **1 min** Insert a 12 mm steel rod between the spokes, in contact with the rim and below the mudguard stays and rotate the wheel to apply a tangentially-upward force of 160N. When tested, the mudguard shall not prevent rotation the wheel or shall obstruct steering.		P
4.12.3	STAGE 2: RADIAL FORCE		N/A

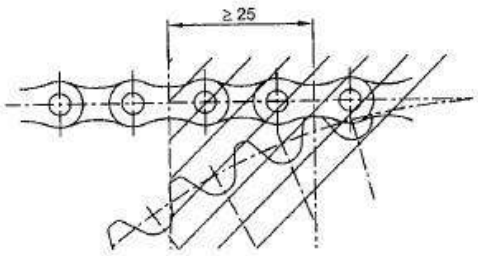
EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	 F= 80N - d = 20 mm - Ø = 20 mm - t = 1 min Press the mudguard 20mm from its free end with a 20mm diameter tools radially towards the tyre with a force F=80N Whilst the force is maintained, rotate the wheel manually in the direction toward.		
4.13	Rim-wear		P
4.13.1.1	PEDAL TREAD The tread surface of a pedal shall be secured against movement within the pedal assembly.		P
4.13.1.2	TOE CLIP		P
	Pedals intended to be used without toe-lips, or for optional use with toe-clip, shall have: - Treas surface on the top and bottom OR - A definite preferred position that automatically pressents the tread surface to the rider’s foot		P
4.13.1.3	Pedals designed to be sued only with toe-clips or shoe-retention devices shall have toe-clip or shoe-retention devices securely attached and need not comply with teh requirements of 4.13.1.2 a) & b)		N/A
4.13.1.3	Pedals designed to be sued only with toe-clips or shoe-retention devices shall have toe-clip or shoe-retention devices securely attached and need not comply with teh requirements of 4.13.1.2 a) & b)		N/A
4.1.3.2	PEDAL CLEARANCE		P
4.1.3.2.1	GROUND CLEARANCE With the bicycle unladen, the pedal at its lowest point, the bicycle shall be capable of being leaned over at an angle of 25o from the vertical before it touches the ground.	Lean angle : 28o	P
	PEDAL CLEARANCE – TOE CLEARANCE 		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	Bicycles shall have at least 100 mm clearance between the pedal and front tyre or mudguard. If a mudguard can be set but is not present during the test, the clearance shall be 125 mm instead of 100mm.		
4.13.3	PEDAL/PEDA-SPINDLE-STATIC STRENGH TEST Apply a vertically-downward force of 1500N for 1 min in the center of the pedal. There shall be no fractures, visible cracks, or distortion of the pedal and pedal spindle.		P
4.13.4	PEDAL-SPINDLE-IMPACT TEST Release a striker of m = 15 kg from a heighth = 400mm  The spindle shall not fracture and the permanent bending shall not exceed 15mm at the point of impact: □ d=60mm from mounting – face of the rigid fixture OR □ d=5 mm from the end of the spindle if the spindle if the spindle is shorter than 65mm)		N/A
4.13.5	PEDAL/PEDAL SPINDLE – DYNAMIC DURABLILITY TEST Suspend a mass m=80 kg at the center of the pedal and drive the shaft at a speed not exceeding 100min-1 during 100000 cycles.  There shall be no fractures or visible cracking of any part of the pedal, the pedal spindle nor any failure bearing system.		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of cycles: 100000 Test frequency: 100 tr/min		
4.13.6	Drive system – STATIC STRENGHT TEST		P
	- For single speed system: apply a Force F increasing progressively to 1500 N vertically downward to the left then right pedal.		N/A
	- In case of multi-speed system: conduct the test below with the highest gear,		P
	Then again with teh lowest gear with an adjusted force: There shall be no fractures of any component of the drive system, and drive capability shall not be lost.		P
4.13.7	CRANK ASSEMBLY – FATIGUE TEST Mount the assembly and incline the crack at 45o to the horizontal. Prevent rotation by locating a suitable length of drive chain around the largest or only chain-wheel then apply a repeated vertical downwards force F=1300 N for 100000 cycles.  There shall be no fractures or visible cracks in the cranks, the bottom bracket spindle or any of the attachment, or loosening or detachment of the chain-wheel from the crank. Test Frequen cy: 2 Hz		P
4.14	SADDLES & SEAT PILLARS		P
4.14.2	LIMITING DIMENSIONS No part of the saddle should be more than 125mm above the top saddle surface.		P
4.14.3	SEAT-PILLAR-INSERTION DEPTH MARK OR POSITIVE STOP The seat-pillar shall be provided with one of the		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	two following alternative means of ensuring a safe insertion-depth into the frame:		
	- Permanent transverse mark of length not less than the external diameter		P
	- A permanent stop to prevent it from being drawn out of the frame such as to leave the insertion less than the amount specified in above.		N/A
4.14.4.1	SADDLES WITH ADJUSTMENT - LAMPS Apply a force of 650 N vertically downwards at a point of 25 mm either the front or rear of the saddle whicherer produces the greater torque on the saddle-clamp. Remove this force and apply a lateral force of 250N horizontally at a point 25 mm from either the front or rear of the saddle.  There shall be no movement		P
4.14.4.2	SADDLES WITHOUT ADJUSTMENT – CLAMPS Saddles that are not clamped but are designed to pivot in a vertical plane with respect to the pillar, shall be allowed to move within the parameter of the design and shall with stand the tests described in 4.14.4.1 without failure of any components.		N/A
4.14.5	SADDLE-STATIC STRENGTH TEST Apply forces F=400N in turn under the rear and nose of the saddle cover.  When tested, the saddle cover and/or plastic moulding shall not disengage from the chassis of the saddle, and there shall be no cracking or permanent distortion of the saddle assembly.		P
4.14.6	SADDLE & SEAT-PILAR CLAMP – FATIGUE TEST		P
	Apply a repeated vertically – downward force		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	F=1000N for 200000 cycles When tested, there shall be no fracture, visible cracks or loosening of any part.		
4.14.7	FATIGUE TEST		P
	Apply a vertically-downward force of 1200N, at 70mm from the center of the saddle clamp, during 100000 cycles. When tested, there shall be no fractures or visible cracks in the seatpillar 		P
4.15	DRIVE-CHAIN Where a chain-drive is used as a means of transmitting the motive force, the chain shall operate over the front and rear sprockets without binding.		P
	The chain shall conform to the requirements of ISO 9633		P
4.16	CHAINGUARD		
4.16.1	Requirements		P
	A bicycle shall be equipped with one of the following: - A chain-wheel disc which conform to 4.16 OR - A protective device which conforms to 4.16.3 OR - Where fitted with positive foot-retention devices on the pedals, a conbined front gear-change guide and a protective device which conform to 4.16.4		P
4.16.2	CHAIN-WHEEL DISC DIAMETER		P
4.16.3	Chain protective device A protective device shall, as minimum, shield the side – plates and top surface of the chain and the chain from the point where the chain-wheel teeth first pass between the side-plates of the chain and forwards round the outer chain-wheel to a		N

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	horizontal line passing through the bottom-bracket axle centre.		
4.16.4	COMBINED FRONT GEAR-CHANGE GUIDE A combined front gear-change guide and protective device shall, as a minimum, shield the outside face of the upper junction of the chain and outer chain-wheel for at least 25mm rearwards along the chain from the point where the chain-wheel first passes between the side-plats of the chain. 		N/A
4.17	SPOKE PROTECTOR		P
	A bicycle with rear gear-change sprockets shall be fitted with a spoke-protector guard to prevent the chain interfering with or stopping rotation of the wheel through improper adjustment or damage.		P
4.18	LUGGAGE CARRIERS		P
4.19	HANDING AND OPERATION OF A FULLY-ASSEMBLED BICYCLE The bicycle shall exhibit stable handling in braking, turning and steering, and it shall be possible to ride with one hand removed from the handlebar without difficulty of operation or hazard to the rider.		P
4.20.1	LIGHTING & REFLECTORS Lightening systems and reflectors may not necessarily be fitted to a city and trekking bicycle but the manufacturer’s instructions shall advise the user to take note of national regulations for the country in which the bicycle is to be used.		P
4.20.2	Wiring hardness When a wiring hardness is fitted, it shall be positioned to avoid any damage by contact with moving parts or sharp edges. All connections shall withstand a tensile force in any direction of 10 N.		P
4.21	Warning device Where a bell or other suitable device is fitted, it shall comply comply with ISO 7636		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
5.	MANUFACURER'S INSTRUCTIONS Each bicycle shall be provided with a set of instruction in the language of the country to which the bicycle will be supplied, containing information on:	English	P
	a) The type of user for which the bicycle has been designed.		P
	b) Preparation for riding – how to measure and adjust the saddle height to suit the rider with an explanation of the insertion depth warning marks on the seat-pillar and handlebar-stem, clear information on which lever operates the front brake, which lever operate the rear brake, and the presence of any brake-power modulators with an explanation of their function and adjustment.		P
	c) Indication of minimum saddle height and the way to measure it.		P
	d) Indication of minimum saddle height and the way to measure it.		P
	e) Recommendations for safe riding – use of a bicycle helmet, regular checks on brakes, tyres, steering, rims, and caution concerning possible increases braking distance in wet weather.		P
	f) The permissible total weight of the rider plus luggage and the maximum total weight (bicycle + rider + luggage)		P
	g) An advisory note to draw attention to the rider plus concerning possible national legal requirements when the bicycle is to be ridden on public roads.		P
	h) Recommended tightening of fasteners related to the handlebar, handlebar-stem, saddle, seat-pillar, and wheels, with torque values for threaded fasteners		P
	i) The method for determining the correct adjustment of quick release devices such as "the mechanism should emboss the fork-ends when closed to the locked position″		P
	j) The correct method of assembling any parts supplied unassembled		P
	k) Lubrication – where and how often to lubricate, and the recommended lubricants		P
	l) The correct chain tension and how to adjust it (if appropriate)		P
	m) Adjustment of brakes and recommendations for the replacement of the friction components		P
	n) Adjustment of brakes and recommendations for		P

EN 14764			
Clause	Requirement + Test	Result - Remark	Verdict
	the replacement of the friction components		
	o) Recommendations on general maintenance		P
	p) The importance of using only genuine replacement parts for safety-critical components		P
	q) Care of the wheel-rims and a clear explanation of any danger of rim-wear (see also 4.11 and 6.1)		P
	r) Appropriate spares, i.e. tyres, tubes, and brake friction-components		P
	s) An advisory note to draw the attention of the rider to possible damage due to intensive use and to recommend periodic inspections of the frame, fork and suspension joints (if any) Any other relevant information may be included at the discretion of the manufacturer.		P
6.1	MARKING - REQUIREMENTS		P
	The frame shall be:		P
	c) Visibly and permanently marked with a successive frame number at a readily visible location such as near the pedal-crank, the seat-pillar, or the handlebar.		P
	d) Visibly and durably marked with the name of the manufacturer or the manufacturer’s representative, and the number of this European standard	EN 14764	P
6.2	DURABILITY TEST		P
	Rub the marking by hand for 15s with a piece of cloth soaked in water and again for 15s with a piece of cloth soaked in petroleum spirit. The marking shall remain easily legible. It shall not be easily possible to remove any label nor shall any label show any sign of curling.		P

Annex I
Electro Magnetic Compatibility test result

1. Test Results

Test Results		PASS
History of failure		None

2. Test summary

EPAC

Test	Test Requirement	Test Method	Class / Severity	Result
Radiated Emission (30MHz to 1000MHz)	EN 15194: 2009 +A1:2011	CISPR 12: 2007 +A1:2009	N/A	PASS
ESD	EN 15194: 2009 +A1:2011	EN 61000-4-2:2009	Contact ±4 kV Air ±8 kV	PASS

ESA

Test	**Test Requirement**	**Test Method**	**Class / Severity**	**Result**
Radiated Emission (30MHz to 1000MHz)	EN 15194: 2009 +A1:2011	CISPR 12: 2007 +A1:2009	N/A	PASS
Stripline test	EN 15194: 2009 +A1:2011	ISO 11452-5:2002	48V/m for 150mm & 12V/m for 800mm 0.01MHz to 400MHz	N/A
TEM cell	EN 15194: 2009 +A1:2011	ISO 11452-3:2016	60V/m 0.01MHz to 200MHz	N/A
Bulk Current Injection	EN 15194: 2009 +A1:2011	ISO 11452-4:2011	48mA 1MHz to 400MHz	N/A
Absorber lined Chamber test	EN 15194: 2009 +A1:2011	ISO 11452-2:2004	24V/m 20MHz to2GHz	PASS

Battery Charger

Test	Test Requirement	Test Method	Class / Severity	Result
Conducted Emission on Main Terminal (150K to 30MHz)	EN 15194: 2009 +A1:2011	EN 55014-1: 2006 +A1:2009+A2:2011	N/A	PASS
Disturbance Power 30MHz to 300MHz	EN 15194: 2009 +A1:2011	EN 55014-1: 2006 +A1:2009+A2:2011	N/A	PASS
Discontinuous Disturbance	EN 15194: 2009 +A1:2011	EN 55014-1: 2006 +A1:2009+A2:2011	N/A	N/A
Radiated Emission 30MHz to 1000MHz	EN 15194: 2009 +A1:2011	EN 55014-1: 2006 +A1:2009+A2:2011	N/A	N/A
Harmonic Current Emission on AC, up to 2kHz	EN 15194: 2009 +A1:2011	EN 61000-3-2:2014	Clause 7 of EN 61000-3-2	N/A
Voltage Fluctuation and Flicker on AC	EN 15194: 2009 +A1:2011	EN 61000-3-3: 2013	Clause 5 of EN61000-3-3	N/A
ESD	EN 15194: 2009 +A1:2011	IEC 61000-4-2: 2008	Contact ±4 kV Air ±8 kV	PASS
Radio frequency electromagnetic fields,80MHz to 1GHz	EN 15194: 2009 +A1:2011	IEC 61000-4-3: 2006 +A1:2007+A2:2010	3V/m 80%, 1kHz, AM	PASS
Electrical Fast Transients (EFT) on AC	EN 15194: 2009 +A1:2011	IEC 61000-4-4:2012	AC ±1.0kV	PASS
Surges Immunity on AC	EN 15194: 2009 +A1:2011	IEC 61000-4-5 :2014	±1kV D.M.† ±2kV C.M.†	PASS
Injected Currents on AC, 150kHz to 80MHz(230MHz)	EN 15194: 2009 +A1:2011	IEC 61000-4-6 :2013	3Vrms (emf), 80%, 1kHz Amp. Mod	PASS
Voltage Dips and Interruptions on AC	EN 15194: 2009 +A1:2011	IEC 61000-4-11 :2004 +A1:2017	0 % UT* for 0.5per 40 % UT* for10per 70 % UT* for 25per	PASS

3. ESA List

Object/Part No.	Manufacturer/Trademark	Type/Model	Technical Data	Mark(s) of conformity
Motor	aoma	16'' AL Wheel	36V250W	CE
Controller	YIERTONG	36V 12	36V 250W	CE
Battery	TIANNENG	LI-ION	36V 10AH	CE
Charger	SANS	SSLC084V42	220V EUROPEAN STANDARD	CE

4. Description Of Support Units

Name / Function	Model No	Remark
N/A	N/A	N/A

5. Standard Applicable for Testing

The customer requested EMC tests.
The standards used were EN 15194: 2009+A1: 2011

EPAC part : Tests Carried Out Under EN 15194: 2009+A1: 2011

Standard	Status
CISPR 12: 2007 Radiated Emissions	√
IEC 61000-4-3: 2006+A1:2007+A2:2010 Radio frequency electromagnetic fields test	√
ISO 11451-1:2015 Radiated immunity	√

X Indicates that the test is not applicable
√Indicates that the test is applicable

ESA part : Tests Carried Out Under EN 15194: 2009+A1: 2011

Standard	Status
ISO 11452-5:2002 Stripline test	X
ISO 11452-3:2016 TEM cell	X
ISO 11452-2:2004 Absorber line Chamber test	√
ISO 11452-4:2011 Bulk Current Injection	X

X Indicates that the test is not applicable
√Indicates that the test is applicable

Battery charger part : Tests Carried Out Under EN 15194: 2009+A1: 2011

Standard	Status
EN 55014-1: 2006+A1:2009+A2:2011 Conducted Emissionon Mains Terminals	√
EN 55014-1: 2006+A1:2009+A2:2011 Disturbance Power	√
EN 55014-1: 2006+A1:2009+A2:2011 Discontinuous Disturbance	X
EN 55014-1: 2006+A1:2009+A2:2011 Radiated Emission	X
EN 61000-3-2: 2014 Harmonic Current Emission on AC	X
EN 61000-3-3: 2013 Voltage Fluctuation and Flicker on AC	√
IEC 61000-4-2 :2008 Electrostatic discharge test	√
IEC 61000-4-3: 2006+A1:2007+A2:2010 Radio frequency electromagnetic fields test	X
IEC 61000-4-4: 2012 Electrical fast transients/burst immunity test	√
IEC 61000-4-5: 2014 Surges test	√
IEC 61000-4-6: 2013 Injected Currents test	√
IEC 61000-4-11: 2004+A1:2017 Voltage dips and interruptions test	√

X Indicates that the test is not applicable
√Indicates that the test is applicable

Note : The EUT does not contain any component which is susceptible from the magnetic field

6. Equipments Used during Test

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	EMI test receiver	Rohde & Schwarz	ESU40	100109	2018-09-05
2	Antenna	SCHWARZBECK	VULB9168	9168-313	2018-09-05
3	CONTROLLER	INNCO	CO200	474	/

Conducted Emission Radiated Powe Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	EMI test receiver	Rohde & Schwarz	ESCS30	100086	2018-09-05
2	Line impedance stabilization network	SCHWARZBEC K	NSLK8127	8127-490	2018-09-05

Radiated Powe

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Absorbing clamp	LUTHI	MDS-21	3583	2018-09-05
2	EMI test receiver	Rohde & Schwarz	ESCS 30	100086	2018-09-05

Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Single phase harmonics & flicker analyzer	EM test	DPA500	V05071001255	2018-09-05
2	AC SOURCE 6KVA	EM test	ACS500	V05071001258	2018-09-05

Absorber line Chamber test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	GENERATOR	R&S	SML03	838503/018	2018-09-05
2	LOG-PERIODIC ANTENNA	R&S	HL 046	100001	2018-09-05
3	High Gain Log-Periodic	AR	HL 046	020-02	2018-09-05
4	POWER AMPLIFIER	AR	500W 1000A	302108	2018-09-05
5	POWER AMPLIFIER	AR	30S1G3	302240	2018-09-05
6	Electric Field Probe	AR	500W 1000A	020-01	2018-09-05
7	High Gain Hom Antenna	AR	AT 4002A	002-15	2018-09-05
8	Single path vehicle LISN	R&S	NNBM 8126-D	010-14	2018-09-05
9	Single path vehicle LISN	R&S	NNBM 8126-D	010-15	2018-09-05
10	Field monitor mainframe,4slors	AR	FM 5004	300546	2018-09-05

Radiated Immunity

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Ultra broadband antenna	Rohde & Schwarz	HL562	100227	2018-09-05
2	Amplifier	AR	30W1000B	0327284	2018-09-05
3	Amplifier	AR	30S1G3	0324978	2018-09-05
4	Power meter	Rohde & Schwarz	NRP	101641	2018-09-05
5	Single generator	Rohde & Schwarz	SMR40	100555	2018-09-05

Electrostatic Discharge Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Electrostatic Discharge Simulator	KIKUSUI	KES4021	LL004261	2018-09-05

EFT Test & Surge Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Ultra-compact simulator	EM test	UCS500M4	V0507100122	2018-09-05

Voltage dips and Interruption Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Ultra-compact simulator	EM test	UCS500M4	V0507100122	2018-09-05
2	Motorised Variac	EM test	MV2616	V0507100123	2018-09-05

Conducted Immunity Test

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	AM/FM signal generator	AEROFLEX	2023A	202306/52	2018-09-05
2	PAMP Conducted RF test system	HAEFFLY	PAMP250	151708	2018-09-05
3	CDN impedance and K-factor	LUTHI	L-801 M2/M3	2117	/

General Equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Next Calibration
1	Atmosphere pressure meter	Shanghai ZhongXuan Electronic Co;Ltd	BY－2003P	/	2018-09-05
2	CLAMP METER	FLUKE	316	86080010	2018-09-05
3	Thermo-Hygrometer	ZHICHEN	ZC!-2	01050033	2018-09-05
4	Thermo-Hygrometer Digital illuminance meter	TES electrica electronic Corp.	TES-1330A	050602219	2018-09-05

7. Emission Test Results

7.1 Conducted Emissions Main Terminal 150kHz to 30MHz

Test Requirement:	EN 15194:2009+A1: 2011
Test Method:	EN 55014-1:2006 +A1:2009+A2:2011
Test Date:	September 22, 2017
Frequency Range:	150KHz to 30MHz
Class/Severity:	N/A
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth for 0.15-30MHz) Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit

7.1.1 E.U.T. Operation

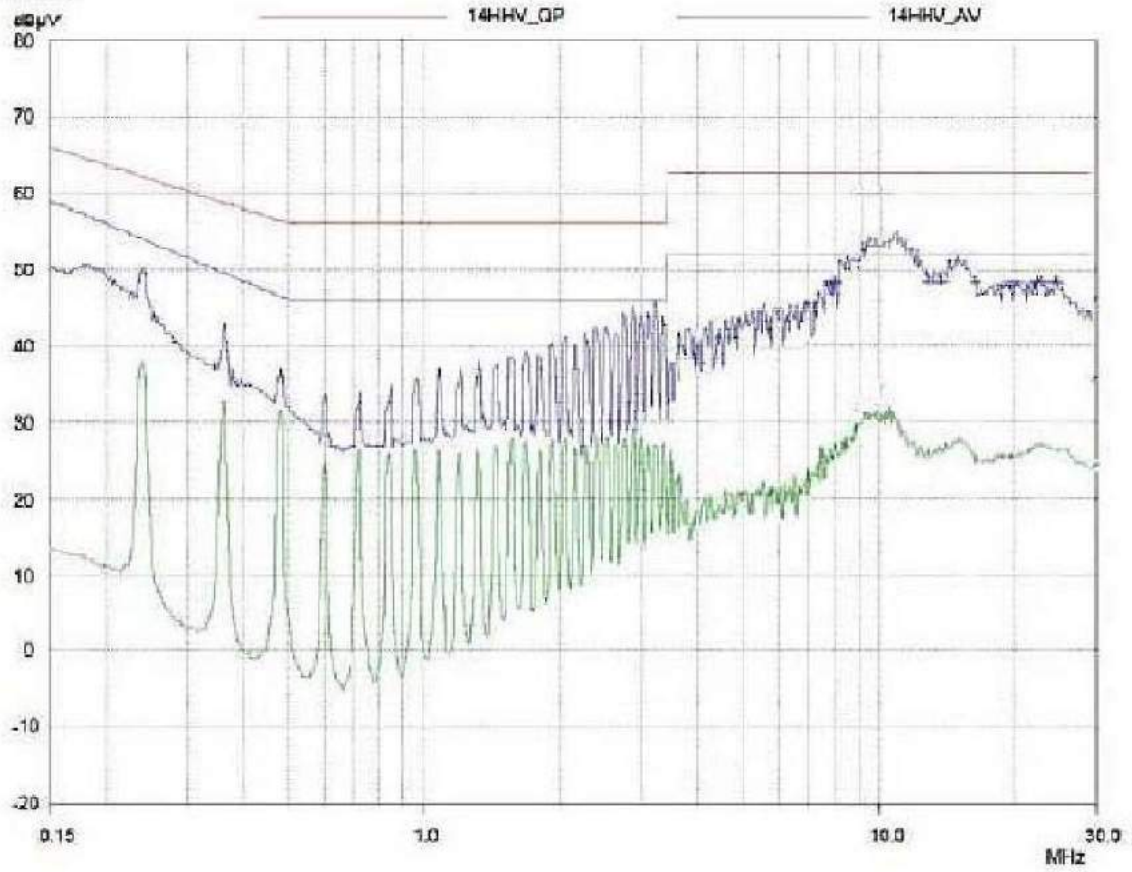
Operating Environment:

Temperature:	22.0℃
Humidity:	46 % RH
Atmospheric Pressure:	1024 mbar
E.U.T. Operation:	The EUT was set to achieve maximum emission.

7.1.2 Measurement Data

L Line

N line

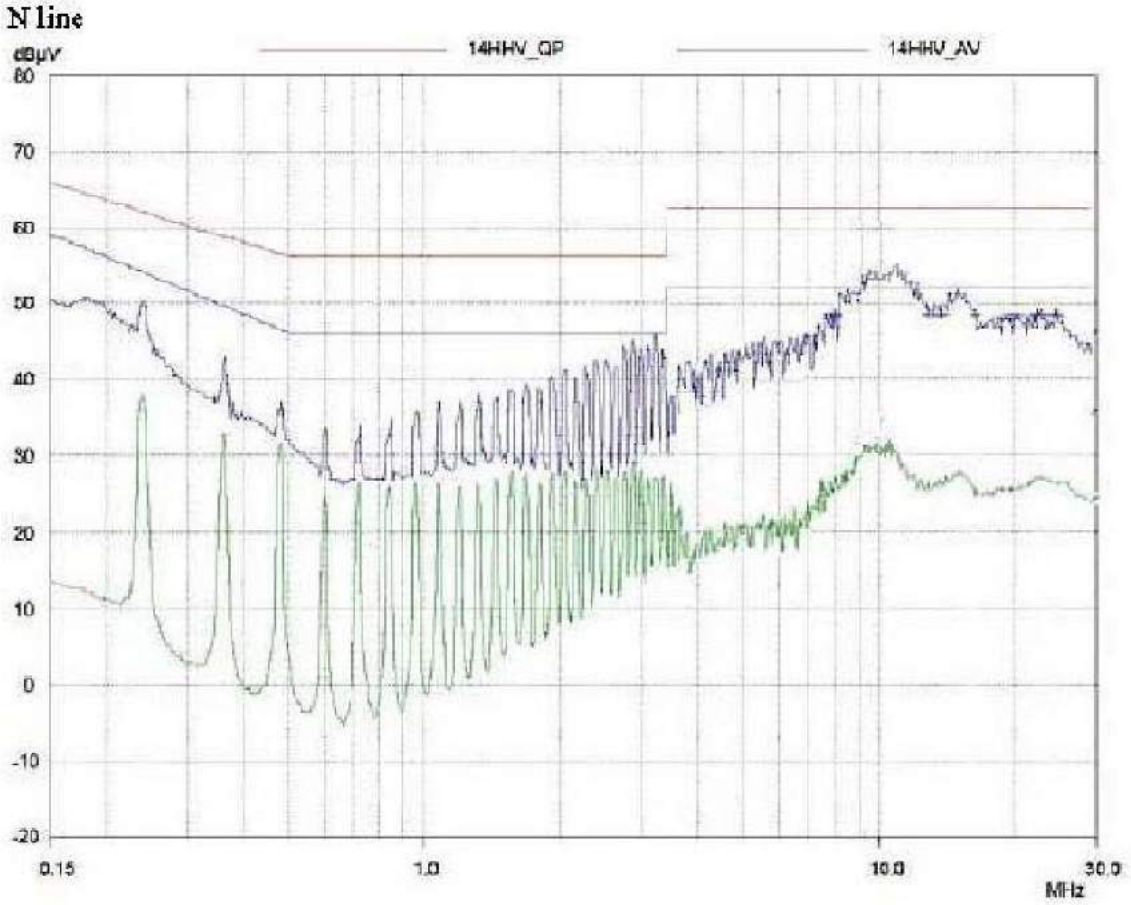


Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.2164	54.16	62.96	8.80
0.3275	49.13	59.51	10.38
1.41693	44.34	56.00	11.66
4.68857	37.27	56.00	18.73
21.82347	47.31	60.00	12.69
27.49661	42.30	60.00	17.70

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.2164	49.85	55.04	5.19
0.3275	45.34	50.57	5.23
1.41693	43.10	46.00	2.90
4.68857	35.87	46.00	10.13
21.82347	44.81	50.00	5.19
27.49661	39.12	50.00	10.88

N Line



Final Measurement Results

Frequency MHz	QP Level dBµV	QP Limit dBµV	QP Delta dB
0.2164	56.98	62.96	5.98
0.3249	49.97	59.58	9.61
0.76214	40.26	56.00	15.74
3.0491	41.22	56.00	14.78
20.80466	28.67	60.00	31.33
21.99605	23.69	60.00	36.31
23.63356	22.38	60.00	37.62

Frequency MHz	AV Level dBµV	AV Limit dBµV	AV Delta dB
0.2164	48.23	55.04	6.81
0.3249	42.96	50.65	7.69
0.76214	40.84	46.00	5.16
3.0491	40.23	46.00	5.77
20.80466	22.53	50.00	27.47
21.99605	16.30	50.00	33.70
23.63356	15.74	50.00	34.26

7.2 Disturbance Power

Test Requirement:	EN 15194: 2009+A1: 2011
Test Method:	EN 55014-1: 2006+A1:2009+A2:2011
Test Date:	September 22, 2017
Frequency Range:	30 to 300MHz
Detector:	Peak for pre-scan (120kHz resolution bandwidth for requency range 30-1000MHz) Quasi-Peak if maximised peak within 6dB of limit
Result:	PASS

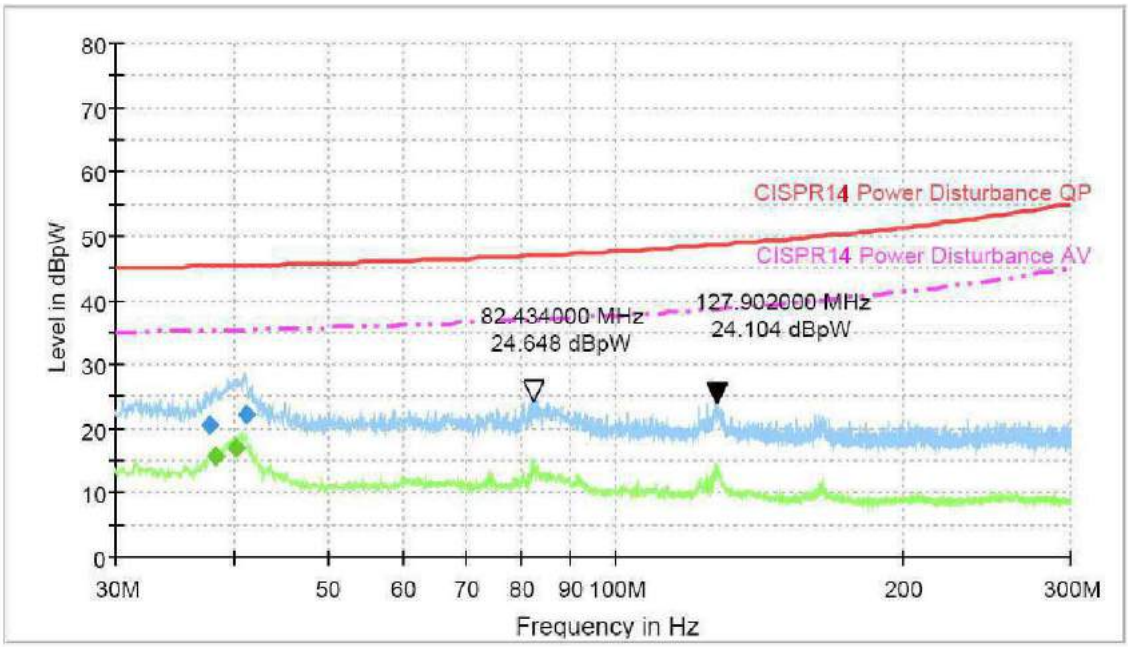
7.2.1 E.U.T. Operation

Operating Environment:

Temperature:	22.0℃
Humidity:	46 % RH
Atmospheric Pressure:	1004 mbar
E.U.T. Operation:	Test the EUT with full function according to standard.

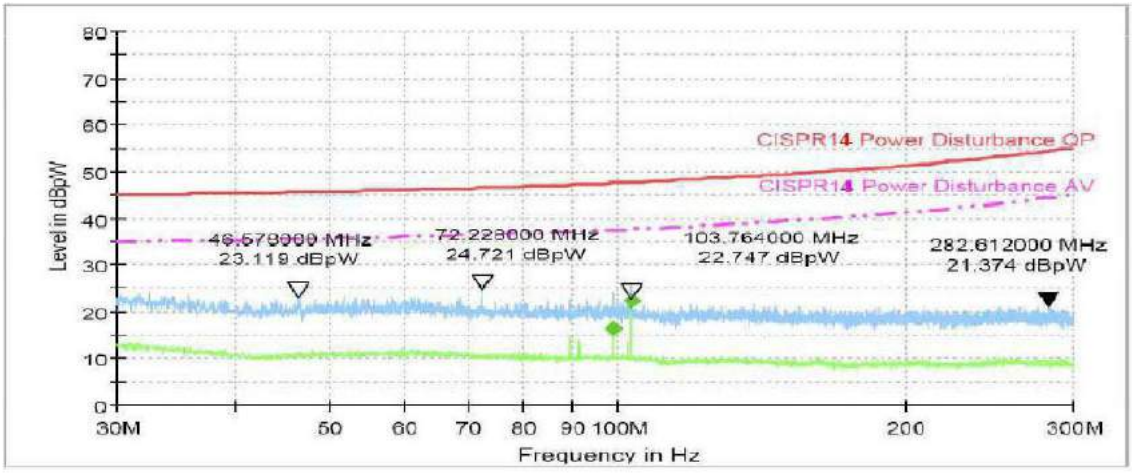
7.2.2 Measurement Data

An initial pre-scan was performed in peak detection mode. Quasi-Peak was performed at the frequencies with maximized peak emission were detected.



Frequency (MHz)	Average (dBpW)	Meas. Time (ms)	Bandwidth (kHz)	Slide bar position (cm)	Corr. (dB)	Margin (dB)	Limit (dBpW)	Comment
38.202000	15.6	1000.000	120.000	4.00	7.8	19.7	35.3	
40.078000	17.0	1000.000	120.000	13.00	7.5	18.4	35.4	

Load Terminal:



Frequency (MHz)	Average (dBpW)	Meas. Time (ms)	Bandwidth (kHz)	Slide bar position (cm)	Corr. (dB)	Margin (dB)	Limit (dBpW)	Comment
99.348000	16.3	1000.000	120.000	47.00	7.1	21.3	37.6	
103.710000	22.1	1000.000	120.000	46.00	6.9	15.6	37.7	

7.3 Flicker Test Results

Test Requirement:	EN 61000-3-3:2013
Test Method:	EN 61000-3-3:2013
Test Date:	September 22, 2017
Class/Severity:	Clause 5 of EN 61000-3-3
Measurement Time:	10min
Detector:	As per EN 61000-3-3
Test Result:	PASS

Maximum Flicker results

	EUT values	Limit	Result
Plt	0.028	0.65	Pass
dc [%]	0.005	3.30	Pass
dmax [%]	0.080	4.00	Pass
dt [s]	0.000	0.50	Pass

7.4 Radiated Emissions (30MHz to 1GHz)

Test Requirement:	EN 15194: 2009+A1: 2011
Test Method:	CISPR 12: 2007
Test Date:	September 22, 2017
Frequency Range:	30MHz to 1GHz
Measurement Distance:	3m(EPAC) & 1m(EAS)
Limit:	According to EN 15194: 2009+A1: 2011
Detector:	Peak for pre-scan (120kHz resolution bandwidth)
	Quasi-Peak if maximised peak within 6dB of limit

7.4.1 E.U.T. Operation

Operating Environment:

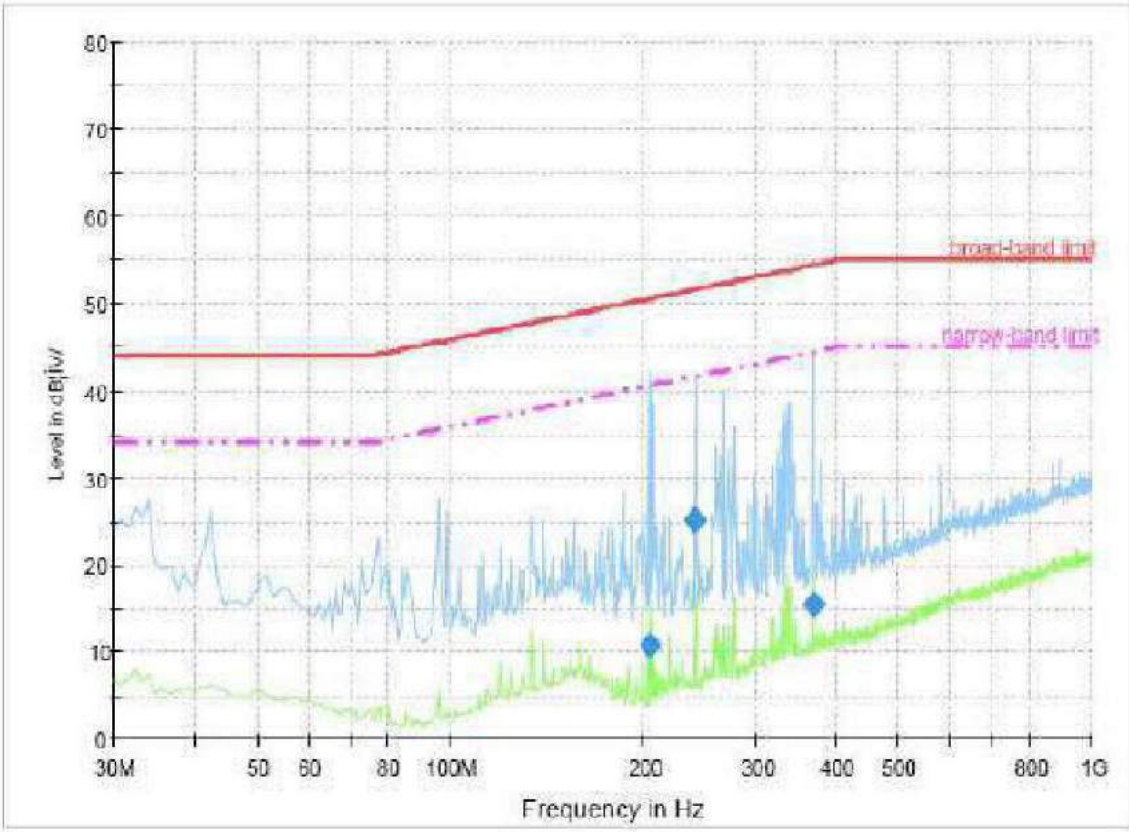
Temperature:	22.0℃
Humidity:	50% RH
Atmospheric Pressure:	1004 mbar
E.U.T. Operation:	The EUT is in representative work mode.

7.4.2 Measurement Data

An initial pre-scan was performed in peak detection mode. Quasi-Peak was performed at the frequencies with maximized peak emission were detected.

EPAC

Horizontal:

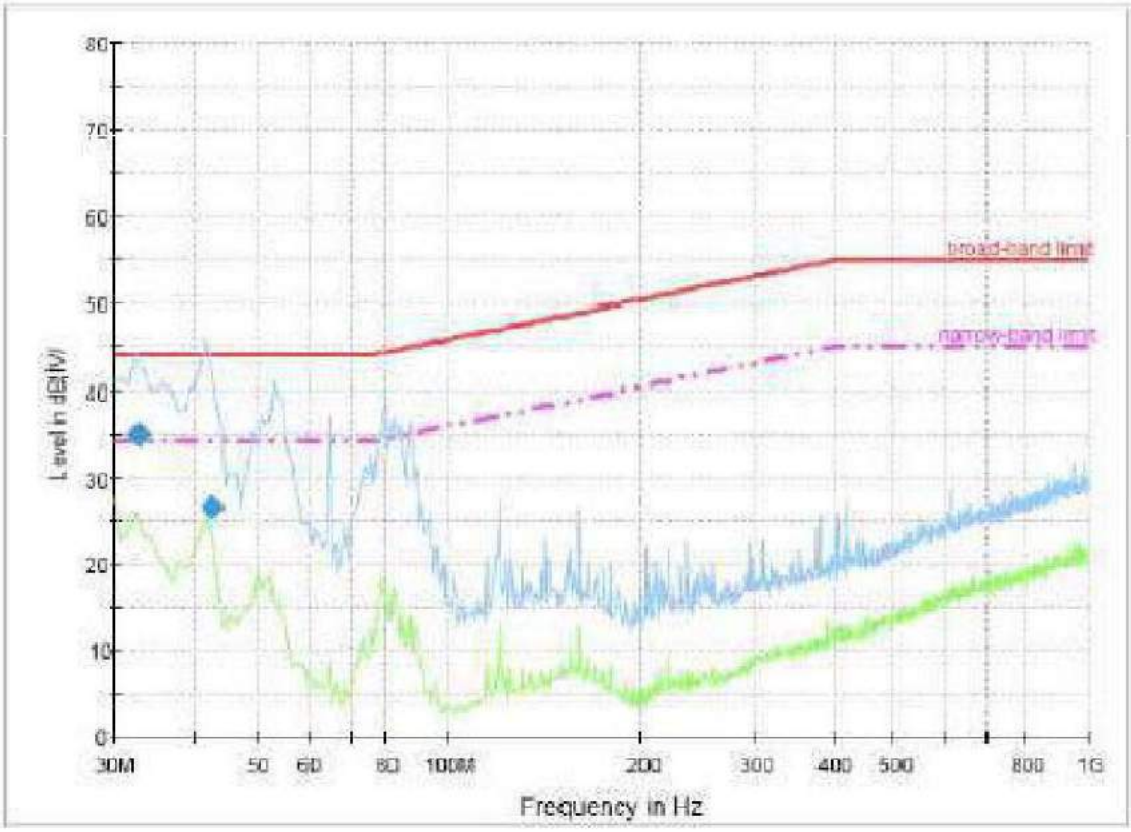


Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
204.811200	10.6	1000.000	120.000	180.0	H	117.0	-11.6	40.0
241.122240	25.1	1000.000	120.000	180.0	H	91.0	-9.9	26.6
369.482240	15.5	1000.000	120.000	180.0	H	337.0	-5.8	39.0

Frequency (MHz)	Limit (dBµV/m)	Comment
204.811200	50.6	
241.122240	51.7	
369.482240	54.5	

Vertical :

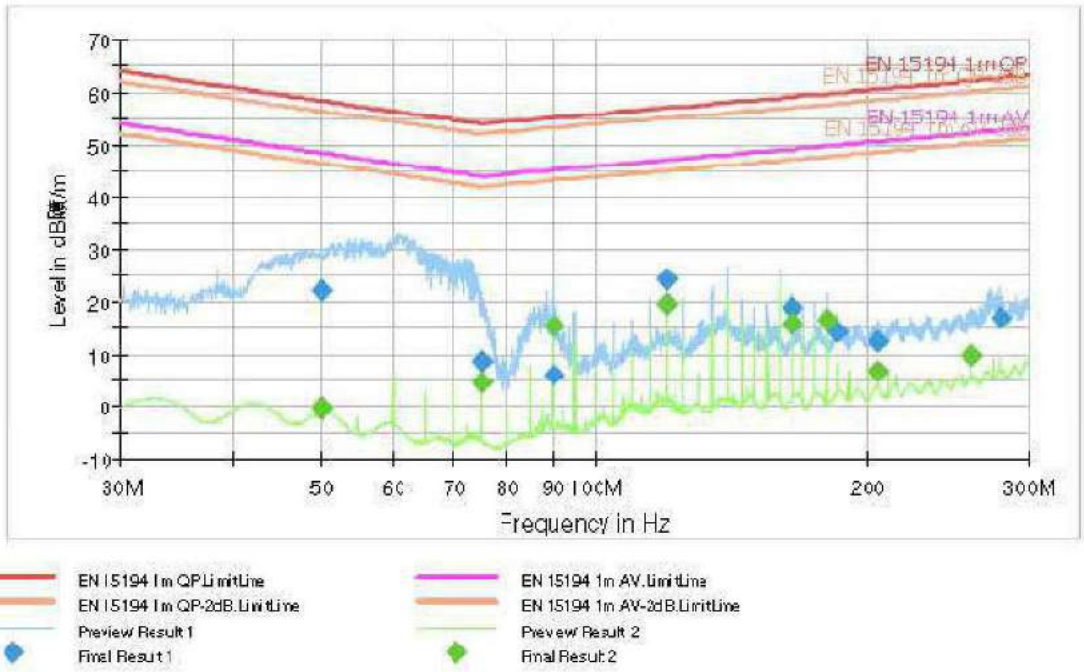


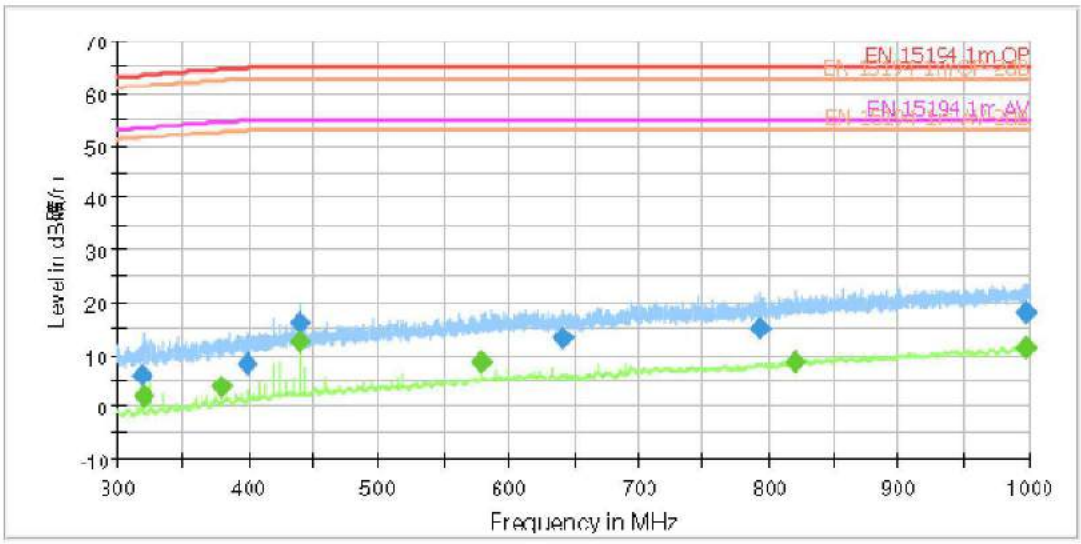
Final Result 1

Frequency (MHz)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Antenna height (cm)	Polarity	Turntable position (deg)	Corr. (dB)	Margin (dB)
32.558400	35.0	1000.000	120.000	180.0	V	223.0	-9.7	9.0
42.509760	26.4	1000.000	120.000	180.0	V	338.0	-9.1	17.6

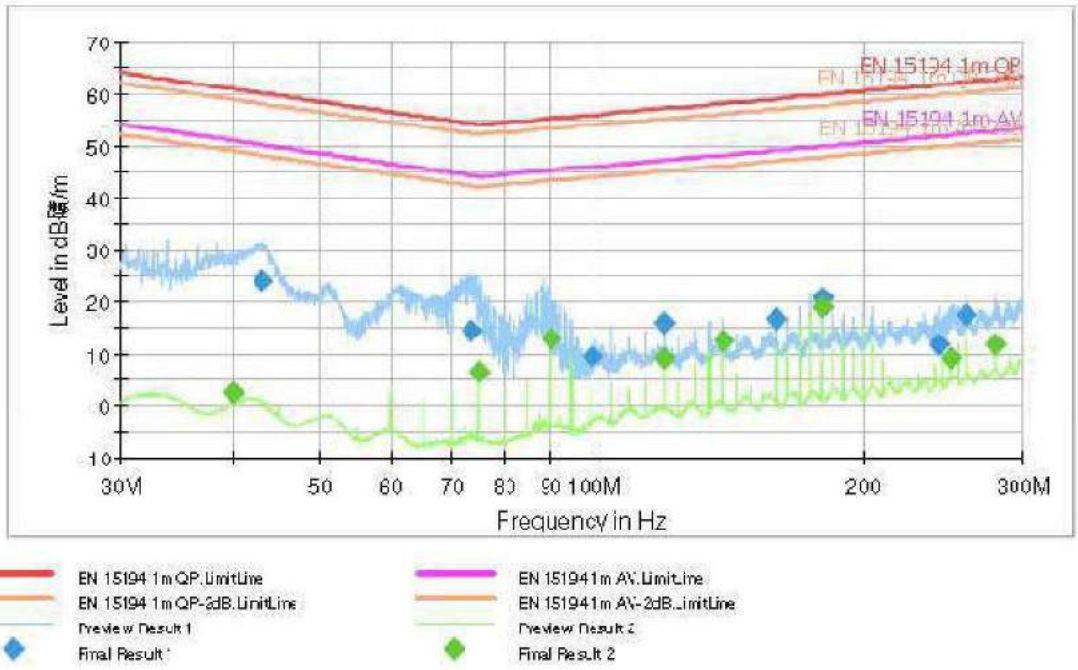
Frequency (MHz)	Limit (dBµV/m)	Comment
32.558400	44.0	
42.509760	44.0	

ESA
Horizontal:

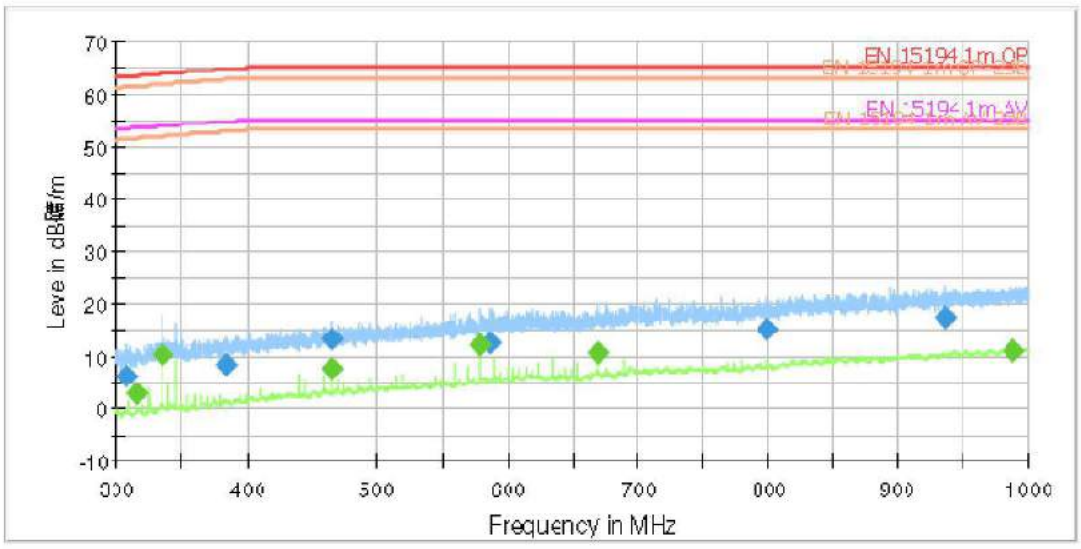




Vertical :


70
60
50
40
30
20
10
0
10
EN 15194 1m QP
EN 15194 1m AV
Level in dB
30M
50
60
70
80
90 100M
200
300M
Frequency in Hz

EN 15194 1m QP.LimitLine
EN 15194 1m QP-2dB.LimitLine
Preview Result 1
Final Result 1
EN 15194 1m AV.LimitLine
EN 15194 1m AV-2dB.LimitLine
Preview Result 2
Final Result 2


70
60
50
40
30
20
10
0
-10
EN 15194 1m QP
EN 15194 1m AV
Leve in dB
400
500
700
900
1000
Frequency in MHz


EN 15194 1m QP.LimitLine
EN 15194 1m QP-2dB.LimitLine
Preview Result 1
Final Result 1
EN 15194 1m AV.LimitLine
EN 15194 1m AV-2dB.LimitLine
Preview Result 2
Final Result 2

8 Immunity Test Results

8.1 ESD

Test Requirement:	EN 15194: 2009+A1: 2011
Test Method:	IEC 61000-4-2 :2008
Test Date:	September 22, 2017
Discharge Impedance:	330 & / 150 pF
Discharge Voltage:	Air Discharge: ±8 kV Contact Discharge: ±4 kV HCP: ±4 kV VCP: ±4 kV
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point for Contact and VCP Discharge; Minimum 10 times at each test point for Air Discharge
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Criteria:	Refer to ISO 10605:2008

8.1.1 E.U.T. Operation

Operating Environment:

Temperature:	23.0℃
Humidity:	46% RH
Atmospheric Pressure:	1007 mbar
E.U.T. Operation:	The EUT is in representative work mode.

8.1.2 Direct Application Test Results

Observations: Test Point:
1. All insulated enclosure & seams around EUT.
2. All touchable metal material of EUT

Direct Application			Test Results	
Discharge Level (kV)	**Polarity (+/-)**	**Test Points**	**Contact Discharge**	**Air Discharge**
8	+/-	1	N/A	A
4	+/-	2	A	N/A

Indirect Application Test Results

Observations:
Test Point: 1. All sides.

Direct Application			Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Points	Horizontal Coupling	Vertical Coupling
4	+/-	1	A	A

Results:
A: No degradation in the performance of the EUT was observed.
N/A: Not applicable (not required in the standard or floor moutned the EUT)

8.2 Electrical Fast Transients (EFT)

Test Requirement: EN 15194: 2009+A1: 2011

Test Method: IEC 61000-4-4: 2012

Test Date: September 22, 2017

T Polarity: Positive & Negative

Test Level: ±1.0kV on AC

Polarity: Positive & Negative

Repetition Frequency: 5kHz

Burst Duration: Single Discharge

Discharge Period: 300ms

Test Duration: 2 minute per level & polarity

Result: PASS

8.2.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0℃

Humidity: 46% RH

Atmospheric Pressure: 1007 mbar

E.U.T. Operation: Test the EUT with full function according to standard.

8.2.2 Test Results On AC Supply:

Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT operating mode working	Observations (Performance Criterion)
L,N,PE	±1.0	Direct	On Working mode	(A)

A: No loss of function was observed.

8.3 Surges

Test Requirement: Test Method: Test Date:

EN 15194: 2009+A1: 2011

Test Level:

±1kV Line to Neutral, ±2kV Line to PE Positive & Negative

Polarity:

Generator source impedance:

2Ω Line to Neutral, 12Ω Line to PE Internal

Trigger Mode:

5 positive, 5 negative at 0°, 90°, 180°, 270°.

No. of surges:

IEC 61000-4-5: 2014

September 22, 2017

Result: PASS

8.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0℃

Humidity: 46% RH

Atmospheric Pressure: 1007 mbar

E.U.T. Operation: Test the EUT with full function according to standard.

8.3.2 Test Results: Pass

Pulse No	Line- Line	Level (kV)	Surge Interval	Phase (deg)	Observation (Performance
1–5	L-N	+1	60s	0°	No loss of performance (A)
6–10	L-N	-1	60s	0°	(A)
11–15	L-N	+1	60s	90°	(A)
16–20	L-N	-1	60s	90°	(A)
21–25	L-N	+1	60s	180°	(A)
26–30	L-N	-1	60s	180°	(A)
31–35	L-N	+1	60s	270°	(A)
36–40	L-N	-1	60s	270°	(A)
1–5	L-PE	+2	60s	0°	(A)
6–10	L-PE	-2	60s	0°	(A)
11–15	L-PE	+2	60s	90°	(A)
16–20	L-PE	-2	60s	90°	(A)
21–25	L-PE	+2	60s	180°	(A)
26–30	L-PE	-2	60s	180°	(A)

Pulse No	Line- Line	Level (kV)	Surge Interval	Phase (deg)	Observation (Performance
31–35	L-PE	+2	60s	270°	(A)
36–40	L-PE	-2	60s	270°	(A)
1–5	N-PE	+2	60s	0°	(A)
6–10	N-PE	-2	60s	0°	(A)
11–15	N-PE	+2	60s	90°	(A)
16–20	N-PE	-2	60s	90°	(A)
21–25	N-PE	+2	60s	180°	(A)
26–30	N-PE	-2	60s	180°	(A)
31–35	N-PE	+2	60s	270°	(A)
36–40	N-PE	-2	60s	270°	(A)

8.4 Injected Currents 0.15MHz to 230MHz

Test Requirement: EN 15194: 2009+A1: 2011

Test Method: IEC 61000-4-6: 2013

Test Date: September 22, 2017

Frequency Range: 0.15MHz to 230MH

Test level: 3V rms on AC Ports (unmodulated emf into 150 &) 80%,

Modulation: 1kHz Amplitude Modulation

Result: PASS

8.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0℃

Humidity: 46% RH

Atmospheric Pressure: 1017 mbar

E.U.T. Operation: Test the EUT with full function according to standard.

8.4.2 Test Results:

Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Observation (Performance Criterion)
150kHz to 230MHz	AC Supply Cable	3Vrms	80%, 1kHz Amp. Mod.	1%	3S	No Loss of Function (A)

8.5 Voltage Dips and Interruptions

Test Requirement: Test Method: Test Date:

Test level:

No. of Dips /
Interruptions:

Result: PASS

8.5.1 E.U.T. Operation
EN 15194: 2009+A1: 2011

IEC 61000-4-11: 2004+A1:2017 September 22, 2017

0% of UT (Supply Voltage) for 0.5 Periods;
40% of UT (Supply Voltage) for 10 Periods;
70 % of UT (Supply Voltage) for 25 Periods.

6 per Level

Operating Environment:

Temperature: 23.0℃

Humidity: 46% RH

Atmospheric Pressure: 1017 mbar

E.U.T. Operation: Test the EUT with full function according to standard.

8.5.2 Test Results:

EUT operating mode	Dropout % UTPhase	Phase	Duration of dropout in Periods	No of dropout	Time between dropout	Observations (Performance Criterion)
On mode	100	0°	0.5	3	10s	(B)
On mode	100	180°	0.5	3	10s	(B)
On mode	60	0°	10	3	10s	(A)
On mode	60	180°	10	3	10s	(A)
On mode	30	0°	50	3	10s	(A)
On mode	30	180°	50	3	10s	(A)

8.6 Absorber line Chamber

Test Requirement: EN 15194: 2009+A1: 2011

Test Method: ISO 11452-2:2004

Test Date: September 22, 2017

Frequency Range: 20MHz to 2 GHz

Test level 24V/m on enclosure

Modulation: 80%, 1kHz Amplitude Modulation

Criteria: Refer to ISO 11452-2:2004

8.6.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0℃

Humidity: 46% RH

Atmospheric Pressure: 1007 mbar

E.U.T. Operation: The EUT is in representative work mode.

Test Results: Pass

8.7 Radiated Immunit

Test Requirement: EN 15194: 2009+A1: 2011

Test Method: ISO 11451-1:2015 & ISO1145-2:2004

Test Date: September 22, 2017

Frequency Range: 20MHz to 2 GHz

Test level 24V/m on enclosure

Modulation: 80%, 1kHz Amplitude Modulation

Criteria: Refer to ISO 11451-1:2015 & ISO1145-2:2004

8.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23.0℃

Humidity: 46% RH

Atmospheric Pressure: 1007 mbar

E.U.T. Operation: The EUT is in representative work mode.

Test Results: Pass