





For

Mid Ocean Brands B.V.

key finder device in bamboo

Test Model: MO6897

Prepared for : Mid Ocean Brands B.V.

Address : 7/F., Kings Tower,111 King Lam Street, Cheung Sha

Wan, Kowloon, Hong Kong

Prepared by : Shenzhen LCS Compliance Testing Laboratory Ltd.

Address : Room 101, 201, Building A and Room 301, Building C,

Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China

Tel : (+86)755-82591330 Fax : (+86)755-82591332 Web : www.LCS-cert.com

Mail : webmaster@LCS-cert.com

Date of receipt of test sample : November 15, 2022

Number of tested samples :

Serial number : Prototype

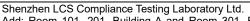
Date of Test : November 15, 2022 ~ November 23, 2022

Date of Report : November 24, 2022



Report No.: LCSA111422204EA







EMC TEST REPORT

ETSI EN 301 489-1 V2.2.3 (2019-11) & Draft ETSI EN 301 489-17 V3.2.5 (2022-08)

Report Reference No.: LCSA111422204EA

Date Of Issue.....: November 24, 2022

Testing Laboratory Name.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Address.....: Room 101, 201, Building A and Room 301, Building C, Juji

Industrial Park, Yabianxueziwei, Shajing Street, Bao'an

Report No.: LCSA111422204EA

District, Shenzhen, Guangdong, China

Testing Location/ Procedure....: Full application of Harmonised standards■

Partial application of Harmonised standards

Other standard testing method

Applicant's Name.....: Mid Ocean Brands B.V.

Address.....: 7/F., Kings Tower,111 King Lam Street, Cheung Sha Wan,

Kowloon, Hong Kong

Test Specification

Standard.....: ETSI EN 301 489-1 V2.2.3 (2019-11)

Draft ETSI EN 301 489-17 V3.2.5 (2022-08)

EN 55032:2015/A11:2020 EN 55035:2017/A11:2020

Test Report Form No. LCSEMC-1.0

TRF Originator.....: Shenzhen LCS Compliance Testing Laboratory Ltd.

Master TRF.....: Dated 2017-06

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Test Item Description.....: key finder device in bamboo

Trade Mark.....: N/A

Test Model.....: MO6897

Ratings.....: DC 3V By CR2032 Button Battery

Result: Positive

Compiled by:

Supervised by:

Approved by:

Rory Awang

U

Gavin Liang/ Manager

Rory Huang/ Administrator

Cary Luo/ Technique principal



Shenzhen LCS Compliance Testing Laboratory Ltd.





EMC -- TEST REPORT

Test Report No. : LCSA111422204EA

November 24, 2022

Date of issue

Test Model....: MO6897

EUT....: key finder device in bamboo

Applicant...: Mid Ocean Brands B.V.

Address...: 7/F., Kings Tower,111 King Lam Street, Cheung Sha Wan, Kowloon, Hong Kong

Telephone...: /

Fax...: /

Manufacturer...: 114628

Address...: /

Telephone...: /

Fax...: /

Test Result	Till the Lab	Positive Positive
	Visi (cs \	

The test report merely corresponds to the test sample.

Factory.....: : 114628

Address.....: : /

Telephone.....: / Fax.....: : /

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.



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Report No.: LCSA111422204EA





	Revision	History	
Report Version	Issue Date	Revision Content	Revised By
000	November 24, 2022	Initial Issue	-

Report No.: LCSA111422204EA

















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TABLE OF CONTENTS



Report No.: LCSA111422204EA

1. GENERAL INFORMATION	7/57 100	6
1.1. PRODUCT DESCRIPTION FOR EQUIPMENT UNDER	R TEST (EUT)	6
1.2. OBJECTIVE		
1.4. Test Methodology		8
1.5. DESCRIPTION OF TEST FACILITY		
1.6. SUPPORT EQUIPMENT LIST		
1.7. EXTERNAL I/O		0 9
1.9. DESCRIPTION OF TEST MODES		9
2. SUMMARY OF TEST RESULTS		10
3.1. LINE CONDUCTED EMISSION	- 11 12 7 m 2 m	
3.1. LINE CONDUCTED EMISSION	TCS Test	
3.2. CONDUCTED EMISSION (WIRED NETWORK PORT		
3.3. RADIATED DISTURBANCE		14
3.5. ELECTROSTATIC DISCHARGE	vii iz)	17
4. GENERAL PERFORMANCE CRITERIA FOR IMM	MUNITY TEST	21
4.1. PERFORMANCE CRITERIA FOR CONTINUOUS PHEI	NOMENA APPLIED TO TRANSMITTER (CT)	21
4.2. PERFORMANCE CRITERIA FOR TRANSIENT PHENC	DMENA APPLIED TO TRANSMITTER (TT)	21
4.3. PERFORMANCE CRITERIA FOR CONTINUOUS PHEI		
4.4. PERFORMANCE CRITERIA FOR TRANSIENT PHENC	` ,	
5. LIST OF MEASURING EQUIPMENT		
6. PHOTOGRAPHS OF TEST SETUP	and the land	24
7 PHOTOGRAPHS OF THE FUT		24



















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1. GENERAL INFORMATION

1.1. Product Description for Equipment Under Test (EUT)

EUT : key finder device in bamboo

Test Model : MO6897

Power Supply : DC 3V By CR2032 Button Battery

Hardware Version : V1.0 Software Version : V1.0

Bluetooth :

Frequency Range : 2402MHz ~ 2480MHz

Channel Number : 40 channels for Bluetooth V4.2 (BT LE)

Channel Spacing : 2MHz for Bluetooth V4.2 (BT LE)

Modulation Type : GFSK for Bluetooth V4.2 (BT LE)

Bluetooth Version : V4.2

Antenna Description: PCB Antenna, 3dBi(Max)







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Les Testing





1.2. Objective

ETSI EN 301 489-1	ElectroMagnetic Compatibility (EMC) standard for radio equipment ar services; Part 1: Common technical requirements; Harmonised Stand ElectroMagnetic Compatibility	
ETSI EN 301 489-17	ElectroMagnetic Compatibility (EMC) standard for radio equipment ar services; Part 17: Specific conditions for Broadband and Wideband D Transmission Systems; Harmonised Standard for ElectroMagnetic Compatibility	
EN 55032	Electromagnetic compatibility of multimedia equipment — Emission Requirements	
EN 55035	Electromagnetic compatibility of multimedia equipment – Immunity requirements	-n-Wi

The objective is to determine compliance with ETSI EN 301 489-1 V2.2.3 (2019-11), Draft ETSI EN 301 489-17 V3.2.5 (2022-08), EN 55032:2015/A11:2020 and EN 55035:2017/A11:2020.













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1.3. Related Submittal(s)/Grant(s)

No Related Submittals.

1.4. Test Methodology

All measurements contained in this report were conducted with ETSI EN 301 489-1 V2.2.3 (2019-11), Draft ETSI EN 301 489-17 V3.2.5 (2022-08), EN 55032:2015/A11:2020 and EN 55035:2017/A11:2020.

1.5. Description of Test Facility

NVLAP Accreditation Code is 600167-0.

FCC Designation Number is CN5024.

CAB identifier is CN0071.

CNAS Registration Number is L4595.

1.6. Support Equipment List

Manufacturer	Description	Model	Serial Number	Certificate

1.7. External I/O

I/O Port Description	Quantity	Cable





1.8. Measurement Uncertainty

Item	MU	Remark
Uncertainty for Power point Conducted Emissions Test	2.42dB	152 10
Uncertainty for Radiation Emission test in 3m chamber	3.54dB	Polarize: V
(30MHz to 1GHz)	4.1dB	Polarize: H
Uncertainty for Radiation Emission test in 3m chamber	2.08dB	Polarize: H
(1GHz to 25GHz)	2.56dB	Polarize: V
Uncertainty for radio frequency	0.01ppm	
Uncertainty for conducted RF Power	0.65dB	
Uncertainty for temperature	0.2℃	
Uncertainty for humidity	1%	
Uncertainty for DC and low frequency voltages	0.06%	10000000000000000000000000000000000000

1.9. Description of Test Modes

There was 2 test Modes TM1 to TM2 were shown below:

: Operate in Bluetooth Mode

TM2 : Idle Mode

***Note:

1. All test modes were tested, but we only recorded the worst case in this report.







Rule	Description of Test Items	Result	
§7.1	Reference to clause 8.4 of ETSI EN 301 489-1 Conducted Emission (AC mains input/output port)	N/A*	
§7.1	Reference to clause 8.3 of ETSI EN 301 489-1 Conducted Emission (DC power input/output port)		
§7.1	Reference to clause 8.7 of ETSI EN 301 489-1 Conducted Emission (Wired network port)	N/A*	
§7.1	Reference to clause 8.2 of ETSI EN 301 489-1 Radiated Emission (Enclosure of ancillary equipment)	Compliant	
§7.1	Reference to clause 8.5 of ETSI EN 301 489-1 Harmonic current emissions (AC mains input port)	N/A*	
§7.1	Reference to clause 8.6 of ETSI EN 301 489-1 Voltage fluctuations and flicker (AC mains input port)	N/A*	
§7.2	Reference to clause 9.3 of ETSI EN 301 489-1 Electrostatic discharge (Enclosure port) (EN 61000-4-2)	Compliant	
§7.2	Reference to clause 9.2 of ETSI EN 301 489-1 RF electromagnetic field (80MHz to 6000MHz) (Enclosure port) (EN 61000-4-3)	Compliant	
§7.2	Reference to clause 9.4 of ETSI EN 301 489-1 Fast transients common mode (signal, wired network and control ports, DC and AC power ports) (EN 61000-4-4)	N/A*	
§7.2	Reference to clause 9.8 of ETSI EN 301 489-1 Surges, line to line and line to ground (AC mains power input ports, wired network ports) (EN 61000-4-5)	N/A*	
§7.2	Reference to clause 9.5 of ETSI EN 301 489-1 RF common mode 0.15MHz to 80MHz (signal, wired network and control ports, DC and AC power ports) (EN 61000-4-6)	N/A*	
§7.2	Reference to clause 9.6 of ETSI EN 301 489-1 Transients and surges in the vehicular environment (ISO 7637-2)	N/A*	
§7.2	Reference to clause 9.7 of ETSI EN 301 489-1 Voltage dips and interruptions (AC mains power input ports) (EN 61000-4-11)	N/A*	











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3. TEST RESULTS

3.1. Line Conducted Emission

3.1.1 Conducted Emission Limit

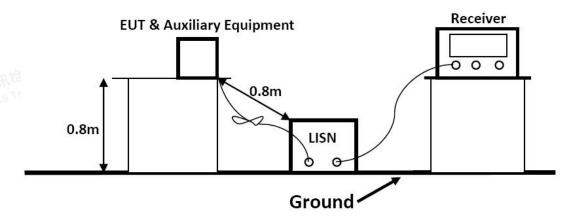
Relevant Standard(s): ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 55032:2015/A11:2020 Class B

Limits for Line Conducted Emission			
Frequency Limit (dBμV)			
(MHz)	Quasi-peak Level	Average Level	
0.15 ~ 0.50	66.0 ~ 56.0 *	56.0 ~ 46.0 *	
0.50 ~ 5.00	56.0	46.0	
5.00 ~ 30.00	60.0	50.0	

NOTE1-The lower limit shall apply at the transition frequencies.

NOTE2-The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

3.1.2 Test Configuration



The setup of EUT is according with per ETSI EN 301 489-1 measurement procedure. The specification used was with the ETSI EN 301 489-1 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The EUT received charging power from the charger which received power through a LISN supplying power of AC 230V/50Hz.



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3.1.3 EMI Test Receiver Setup

During the conducted emission test, the EMI test receiver was set with the following configurations:

551gai.sta51.51	
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	150KHz ~ 30MHz
(IF)RBW	9kHz

All data was recorded in the Quasi-peak and average detection mode.

3.1.4 Test Procedure

Power on the EUT, the EUT begins to work. Make sure the EUT operates normally during the

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

3.1.5 Test Results

Not applicable.







Report No.: LCSA111422204EA









3.2. Conducted Emission (Wired Network Port)

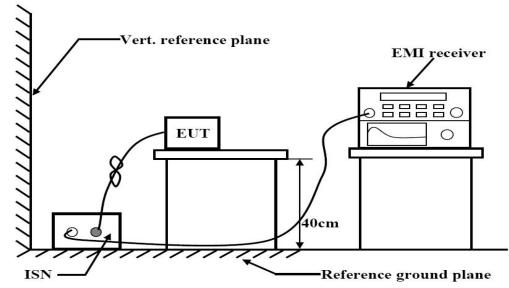
3.2.1 Conducted Emission Limit(Wired Network Port)

Limits for asymmetric mode conducted emissions				
	Class B voltage limits		Class B current limits	
Frequency	(dB	(dBμV)		μ A)
(MHz)	Quasi-peak	Average	Quasi-peak	Average
	Level	Level	Level	Level
0.15 ~ 0.50	84.0~74.0	74.0~64.0	40.0~30.0	30.0~20.0
0.50 ~ 30.00	74.0	64.0	30.0	20.0

NOTE 1-The limits decrease linearly with the logarithm of the frequency in the range 0,15 MHz to 0,5 MHz.

NOTE 2-The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150Ω to the telecommunication port under test (conversion factor is 20 log10 150 / I = 44 dB).

3.2.2 Test Configuration





Report No.: LCSA111422204EA

3.2.3 EMI Test Receiver Setup

During the conducted emission test, the EMI test receiver was set with the following configurations:

cornigarations.	T 05 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	150KHz ~ 30MHz
(IF)RBW	9kHz

All data was recorded in the Quasi-peak and average detection mode.

3.2.4 Test Procedure

Please refer to ETSI EN 301 489-1 Clause 8.7.2 and EN 55032 Clause 6 for the measurement methods.

3.2.5 Test Results

Not applicable.



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3.3. Radiated Disturbance

3.3.1 Radiated Emission Limit

Relevant Standard(s): ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 55032:2015/A11:2020 Class B

Limits for Radiated Disturbance Below 1GHz						
Frequency (MHz)	Facility	Distance (Meters)	Field Strengths Limit (dBµV/m)			
30 ~ 230	FAR	3	42-35			
230 ~ 1000	FAR	3	42			

⁽²⁾ Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the EUT.

Limits for Radiated Disturbance Above 1GHz					
Frequency	Distance	Peak Limit	Average Limit		
(MHz) (Meters)		(dBµV/m)	(dBµV/m)		
1000 ~ 3000	3	70	50		
3000 ~ 6000	74	54			
***Note: The lower limit applies at the transition frequency.					

Limits for Radiated Disturbance Below 1GHz (For FM Receivers)					
Frequency	Distance	Class B Limit (dBµV/m)			
(MHz)	(Meters)	Fundamental	Harmonics		
30 ~ 230	3		52		
230 ~ 300	3	60	52		
300 ~ 1000	3		56		

^{***}Note: These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the LO.

Signals at all other frequencies shall be compliant with the limits given in above Table.

Limits for Radiated Disturbance Above 1GHz (For FM Receivers)					
1000 ~ 3000	3	70	50		
3000 ~ 6000	3	74	54		
***Note: The lower limit ap	olies at the trans	tion frequency.	Wag Tee		











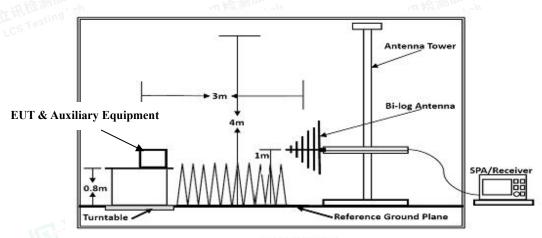
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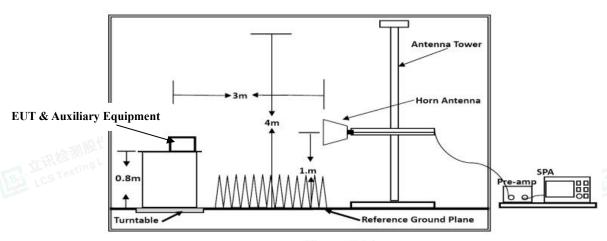
⁽¹⁾ The smaller limit shall apply at the combination point between two frequency bands.



3.3.2 Test Configuration



Below 1GHz



Above 1GHz

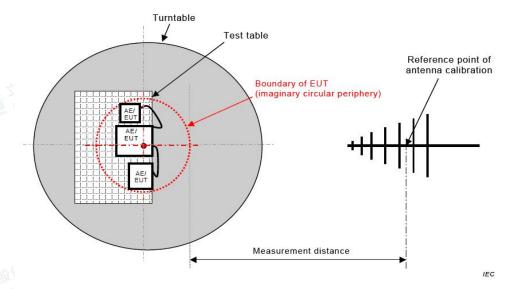


Figure C.1 - Measurement distance

Test Setup for FM Receiver



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Turntable Test table Boundary of EUT (imaginary circular periphery) AE/ AE/ Start position for measurement distance. (End position, reference point of antenna calibration, not shown.)

Figure C.2 - Boundary of EUT, Local AE and associated cabling

Test Setup for FM Receiver

3.3.3 Test Procedure

The test method shall be in accordance with CENELEC EN 55032 [1], annex A.1

3.3.4 Test Results

PASS

The worst test mode of the EUT was TM1, and its test data please refer to Appendix A.1 for Emission and Immunity test results.











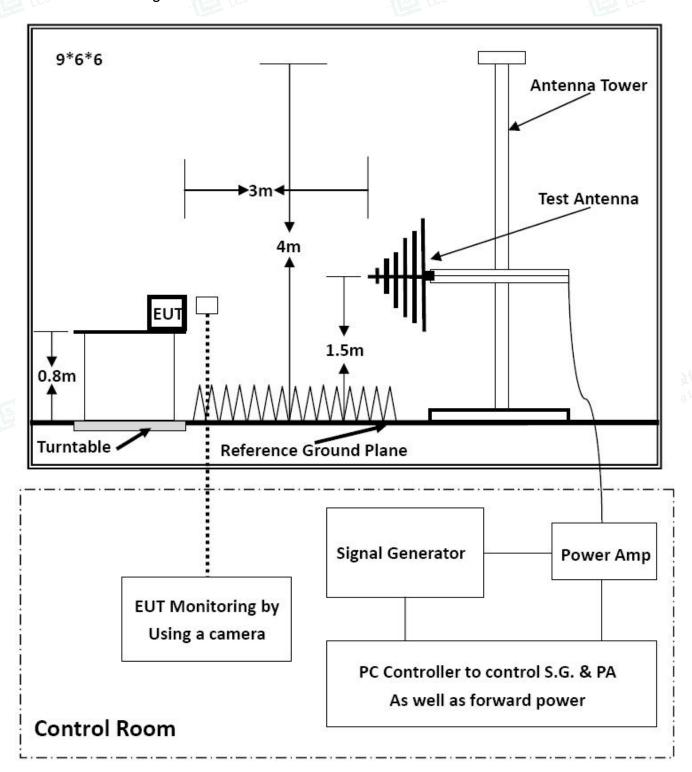
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3.4. RF Electromagnetic Field (80 MHz - 6000 MHz)

3.4.1 Test Configuration





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3.4.2 Test Standard

ETSI EN 301 489-1, ETSI EN 301 489-17 (EN 61000-4-3: 2006+A2: 2010)

Test level 2 at 3V/m.

3.4.3 Severity Level

Level	Field Strength (V/m)
1	1
2	3
3	10
X	Special
Performance Criterion:	A THE

3.4.4 Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. EUT is set 3 meter away from the transmitting antenna which is mounted on an antenna tower. Both horizontal and vertical polarization of the antenna are set on test. Each of the four sides of EUT must be faced this transmitting antenna and measured individually. In order to judge the EUT performance, a CCD camera is used to monitor EUT screen. All the scanning conditions are as follows:

Condition of Test	Remark		
Fielded Strength	3 V/m (Severity Level 2)		
Radiated Signal	Unmodulated		
Scanning Frequency	80-6000MHz		
Dwell time of radiated	0.0015 decade/s		
Waiting Time	3 Sec.		

3.4.5 Test Results

PASS

Please refer to Appendix A.2 for Emission and Immunity test results.









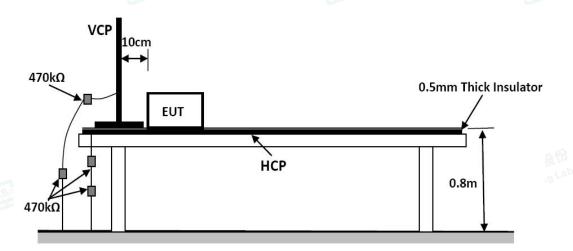


1



3.5. Electrostatic Discharge

3.5.1 Test Configuration



EN 61000-4-2 specifies that a tabletop EUT shall be placed on a non-conducting table which is 80 centimeters above a ground reference plane and that floor mounted equipment shall be placed on a insulating support approximately 10 centimeters above a ground plane. During the tests, the EUT is positioned over a ground reference plane in conformance with this requirement.

For tabletop equipment, a 1.5 by 1.0-meter metal sheet (HCP) is placed on the table and connected to the ground plane via a metal strap with two 470 k Ohms resistors in series. The EUT and attached cables are isolated from this metal sheet by 0.5-millimeter thick insulating material. A Vertical Coupling Plane (VCP) grounded on the ground plane through the same configuration as in the HCP is used.



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3.5.2 Test Procedure

ETSI EN 301 489-1 V2.2.3 (2019-11) / EN 61000-4-2: 2009 Test level 3 for Air Discharge at ±8 kV Test level 2 for Contact Discharge at ±4 kV

3.5.2.1 Air Discharge

This test is done on a non-conductive surface. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

3.5.2.2 Contact Discharge

All the procedure shall be same as Section 3.5.2.1. except that the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

3.5.2.3 Indirect Discharge For Horizontal Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied at the front edge of each HCP opposite the center point of each unit (if applicable) of the EUT and 0.1m from the front of the EUT. The long axis of the discharge electrode shall be in the plane of the HCP and perpendicular to its front edge during the discharge.



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3.5.2.4 Indirect Discharge For Vertical Coupling Plane

At least 10 single discharges (in the most sensitive polarity) shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

3.5.3 Test Results

PASS

Please refer to Appendix A.3 for Emission and Immunity test results.

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4. GENERAL PERFORMANCE CRITERIA FOR IMMUNITY TEST

4.1. Performance criteria for Continuous phenomena applied to Transmitter (CT)

For equipment of type II or type III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence. Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

Report No.: LCSA111422204EA

4.2. Performance criteria for Transient phenomena applied to Transmitter (TT)

For equipment of type II or type III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence. Where the EUT is a transmitter, tests shall be repeated with the EUT in standby mode to ensure that any unintentional transmission does not occur.

4.3. Performance criteria for Continuous phenomena applied to Receiver (CR)

For equipment of type II or III that requires a communication link that is maintained during the test, it shall be verified by appropriate means supplied by the manufacturer that the communication link is maintained during each individual exposure in the test sequence. Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.

4.4. Performance criteria for Transient phenomena applied to Receiver (TR)

For equipment of type II or type III that requires a communication link that is maintained during the test, this shall be verified by appropriate means supplied by the manufacturer during each individual exposure in the test sequence. Where the EUT is a transceiver, under no circumstances shall the transmitter operate unintentionally during the test.



B





Performance criteria for Draft ETSI EN 301 489-17 V3.2.5 (2022-08)

Criteria	During test	After test
Shall operate as intended. (See note).		(i.e. as a result of the application of the test Shall operate as intended. Shall be no degradation of performance.
Α	Shall be no loss of function. Shall be no unintentional transmissions.	Shall be no degradation of performance. Shall be no loss of function. Shall be no loss of critical stored data.
В	May be loss of function.	Functions shall be self-recoverable. Shall operate as intended after recovering. Shall be no loss of critical stored data.
С	May be loss of function.	Functions shall be recoverable by the operator. Shall operate as intended after recovering. Shall be no loss of critical stored data.

6.2.2.









Report No.: LCSA111422204EA











Shenzhen LCS Compliance Testing Laboratory Ltd.
Add: Room 101, 201, Building A and Room 301, Building C, Juji Industrial Park, Yabianxueziwei, Shajing Street, Bao'an District, Shenzhen, Guangdong, China
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com
Scan code to check authenticity



5. LIST OF MEASURING EQUIPMENT

RADIATED DISTURBANCE

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI Test Software	Farad	EZ	/	N/A	N/A
2	3m Full Anechoic Chamber	MRDIANZI	FAC-3M	MR009	2021-09-25	2024-09-24
3	Positioning Controller	Max-Full	MF7802BS	MF780208586	N/A	N/A
4	By-log Antenna	SCHWARZBECK	VULB9163	9163-470	2021-09-12	2024-09-11
5	Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-1925	2021-09-05	2024-09-04
6	EMI Test Receiver	R&S	ESPI	101940	2022-08-18	2023-08-17
7	Broadband Preamplifier	1	BP-01M18G	P190501	2022-06-16	2023-06-15
8	MXA Signal Analyzer	Agilent	N9020A	MY50510140	2022-10-29	2023-10-28
9	RS SPECTRUM ANALYZER	R&S	FSP40	100503	2022-10-29	2023-10-28
10	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2022-06-16	2023-06-15

RF ELECTROMAGNETIC FIELD

Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	RS Test Software	Tonscend	1	1	N/A	N/A
2	MXG Vector Signal Generator	Agilent	E4438C	MY42081396(6G)	2022-06-16	2023-06-15
3	3m Full Anechoic Chamber	MRDIANZI	FAC-3M	MR009	2021-09-25	2024-09-24
4	RF POWER AMPLIFIER	OPHIR	5225R	1052	2022-06-16	2023-06-15
5	RF POWER AMPLIFIER	OPHIR	5273F	1019	2022-06-16	2023-06-15
6	RF POWER AMPLIFIER	SKET	HAP_0306G-50W	Mill part Lab	2022-06-16	2023-06-15
710	Stacked Broadband Log Periodic Antenna	SCHWARZBECK	STLP 9128	9128ES-145	NCR	NCR
8	Stacked Mikrowellen LogPer Antenna	SCHWARZBECK	STLP 9149	9149-482	NCR	NCR
9	RS Electric field probe	narda	EP 601	611WX80208	2022-06-16	2023-06-15
10	Sound Level meter	BK Precision	735	7350087310010020	2022-06-16	2023-06-15
11	Audio Analyzer	R&S	UPV	1146.2003K02-1017 21-UW	2022-10-29	2023-10-28
12	Mouse Simulation	Bruel & Kjaer	4227	A0304216	2022-06-16	2023-06-15
13	Ear Simulation and supply	Bruel & Kjaer	2669.4182.5935	A0305284	2022-06-16	2023-06-15
14	Acoustical Calibrators	Bruel & Kjaer	4231	A0304215	2022-06-16	2023-06-15
15	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2022-06-16	2023-06-15

ELECTROSTATIC DISCHARGE

	1220111001111100111111102					
Item	Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	ESD Simulator	SCHLODER	SESD 230	604035	2022-07-18	2023-07-17
2	WIDEBAND RADIO COMMUNICATION TESTER	R&S	CMW 500	103818	2022-06-16	2023-06-15

Note: NCR --- No calibration requirement











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Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com







6. PHOTOGRAPHS OF TEST SETUP

Please refer to separated files Appendix B for Photographs of Test Setup_EMC

7. PHOTOGRAPHS OF THE EUT

Please refer to separated files Appendix C for Photographs of The EUT.

-----THE END OF REPORT------



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