RF-EXPOSURE REPORT

EN 50663

RF-Exposure evaluation of of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10 MHz - 300 GHz)

Report Reference No	G0M-1901-7972-TEU663EX-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	DAkkS - Registration number : D-PL-12092-01-02
Applicant	Autovice ApS
Address	Kornmarksvej 6 2605 Brøndby Denmark
Standard	EN 50360:2017 EN 50566:2017 EN 50663:2017 EN 62479:2010
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Traffic alarm/Bluetooth device
Model(s)	ooono
Additional Model(s)	None
Brand Name(s)	ooono
Hardware Version(s)	V2
Software Version(s)	DTM firmware for RED testing
Test Result	**PASSED**

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Test Lab Temperature	15 - 35 °C	
Test Lab Humidity	30 – 50 %	
Date of receipt of test item	2019-01-30	
Report:		
Compiled by	Abdullah Al Jamal	
Tested by (+ signature) (Responsible for Test)	Burkhard Pudell	B. Pudell .....
Approved by (+ signature) (Deputy Head of Lab)	Toralf Jahn	T. J .....
Date of Issue	2019-02-25	
Total number of pages	13	
General Remarks:		
The test results presented in this report relate only to the object tested. **The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.** This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		
None.		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2019-02-25	Initial Release	

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EIRP	Equivalent Isotropic Radiated Power
ERP	Effective Radiated Power
EUT	Equipment Under Test
LPE	Low Power Exclusion

REPORT INDEX

1 Equipment (Test Item) Under Test 6
1.1 Reference Documents 7
1.2 Standalone Sources 8
2 Result Summary 9
3 RF-Exposure Classification 10
4 RF-Exposure Limits 11
4.1 Workers 11
4.2 General Public 11
5 RF-Exposure Evaluation 12
6 Evaluation Results 13

1 Equipment (Test Item) Under Test

Description	Traffic alarm/Bluetooth device
Model	ooono
Additional Model(s)	None
Brand Name(s)	ooono
Serial Number(s)	Not specified (test sample 22542, radiated measurements) Not specified (test sample 22544, conducted measurements)
Hardware Version(s)	V2
Software Version(s)	DTM firmware for RED testing
Equipment type	End Product
Environment	Uncontrolled / General Public

1.1 Reference Documents

Document Type	Document No.	Issued by	Date
European council recommendation	1999/519/EC	European Commission	1999-07-30
European council directive	2013/35/EU	European Parliament and the Council	2013-06-26
Test Report ETSI EN 300 328 V2.1.1 (2016-11)	G0M-1901-7972-TEU328BL-V01	Eurofins Product Service GmbH	2019-02-25

1.2 Standalone Sources

Standalone Sources				
Mode	**Operating Frequency Range [MHz]**	**Maximum conducted level [dBm]**	**Maximum radiated level [dBm]**	**Maximum duty cycle [%]**
Bluetooth Low Energy (LE)	2402 – 2480	-4.8	-4.8	64

2 Result Summary

EN 50663				
Product Standard Reference	**Requirement**	**Reference Method**	**Mode**	**Verdict**
EN 50663 Section 4, 6	Low-power RF-exposure conformity	EN 62479	Bluetooth Low Energy (LE)	PASS
Comment: None.				

3 RF-Exposure Classification

RF-Exposure Categories	
Workers	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General public	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

4 RF-Exposure Limits

4.1 Workers

Limits for Workers			
Frequency range	**Body region**	**Power [mW / dBm)]**	**Averaging time [min]***
10 MHz – 6 GHz	Head and trunk	100 / 20	6
10 MHz – 6 GHz	Limbs	200 / 23	6
6 GHz –300 GHz	All	100 / 20	$6 / 68/f^{1.05}$
* = For frequencies between 100 kHz and 10 GHz S, E2, H2 and B2 are to be averaged over six minutes periode. For frequencies exceeding 10 GHz S, E2, H2 and B2 are to be averaged over any 68/f1.05-minute periode (f in GHz).			

4.2 General Public

Limits for general public			
Frequency range	**Body region**	**Power [mW / dBm]**	**Averaging time [min]***
10 MHz – 10 GHz	Head and trunk	20 / 13	6
10 MHz – 10 GHz	Limbs	40 / 16	6
10 GHz –300 GHz	All	20 / 13	6
* = For frequencies between 100 kHz and 10 GHz S, E2, H2 and B2 are to be averaged over six minutes periode. For frequencies exceeding 10 GHz S, E2, H2 and B2 are to be averaged over any 68/f1.05-minute periode (f in GHz).			

5 RF-Exposure Evaluation

Evaluation Relations
$$DCC\ [dB] = 10 \cdot Log_{10}\left(\frac{DC[\%]}{100}\right)$$
Evaluation Procedure
For low-power devices the harmonized product standards EN 50360 (devices next to the ear) and EN 50566 (body worn devices) permit a low power exclusion according to the limits and procedures given in EN 50663. The EN 50663 standard defines the exclusion power values and describes an evaluation procedure with reference to EN 62479. So the assessment is performed according to EN 62479 Section 4 route D and the limits are determined according to basic restrictions given in 1999/519/EC or 2013/35/EU and EN 50663 according to the exposure category declared by customer. Standalone operation evaluation: For the current assessment the lower power exclusion level for the maximum allowed output power is used (route D). Therefore the most restrictive basic restriction for the transmitter frequency under assessment is determined and the corresponding low power exclusion power level is calculated. Next the maximum radiated power levels for the transmitter are taken from the referenced radio test reports and all power levels are converted to average power values. The average power values are compared to the low power exclusion levels. If all power levels are below the power exclusion level the device or radiation source of the EUT complies with the basic restriction. Concurrent operation evaluation: The total power of all radiation sources (the sum of all power values) is compared with the most stringent power limit of all involved frequency ranges and body regions

6 Evaluation Results

Results – Standalone Operational Modes							
Mode	Frequency [MHz]	Power [dBm]	Duty Cycle [%]	Duty Cycle Corr. [dB]	Average Power [dBm]	Power Limit [dBm]	Verdict
Bluetooth Low Energy (LE)	2402	-4.8	64	0	-6.7	13	PASS
Comment: None.							

Results – Concurrent Operational Modes			
Mode	Total Average Power [dBm]	Power Limit [dBm]	Verdict
N/A	N/A	N/A	N/A
Comment: None.			