

RF-EXPOSURE ASSESSMENT REPORT

**FCC 47 CFR Part 2.1093
Industry Canada RSS-102**

RF-Exposure evaluation of portable equipment

Report Reference No. : G0M-1305-2859-TFC093P-V01

Testing Laboratory : Eurofins Product Service GmbH

Address : Storkower Str. 38c
15526 Reichenwalde
Germany

Accreditation :



A2LA Accredited Testing Laboratory, Certificate No.: 1983.01
FCC Filed Test Laboratory, Reg.-No.: 96970
IC OATS Filing assigned code: 3470A

Applicant's name : Bang & Olufsen Medicom A/S

Address : Gimsinglundvej 20
7600 Struer
DENMARK

Test specification:

Standard..... : 47 CFR 1.1310 / 47 CFR 2.1091 / 47 CFR 2.1093
OET Bulletin 65:1997
KDB 447498 D01 v05r01:2013-05-28
RSS-102, Issue 4:2010
Safety Code 6:2009

Equipment under test (EUT):

Product description	Electronic Auto-injector	
Model No.	betaCONNECT	
Hardware version	B11	
Firmware / Software version	None	
	FCC-ID: 2AAGY-BETAC1	IC: 3775E-BETAC1

Test result : **Passed**

Possible test case verdicts:

- not applicable to test object : N/A
- test object does meet the requirement..... : P (Pass)
- test object does not meet the requirement..... : F (Fail)

Testing:

Date of receipt of test item : 2013-07-01

Date (s) of assessment : 2013-09-20

Compiled by : Christian Weber

 Assessed by (+ signature) : Christian Weber
 (Testing Manager)



 Approved by (+ signature) : Toralf Jahn
 (Test Lab Manager)



Date of issue : 2013-09-20

Total number of pages : 12

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:

Version History

Version	Issue Date	Remarks	Revised by
01	2013-09-20	Initial Release	

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1 Equipment (Test item) Description

Description	Electronic Auto-injector
Model	betaCONNECT
Serial number	None
Hardware version	B11
Software / Firmware version	None
FCC-ID	2AAGY-BETAC1
IC	3775E-BETAC1
Equipment type	End product

1.1 Reference Documents

Document type	Document No.	Issued by	Date
FCC 15.247 Bluetooth Radio Report	G0M-1305-2859-TFC247W-V01	Eurofins Product Service GmbH	2013-08-30

1.2 Radiation Sources

Mode #	Description	
Bluetooth LE	Frequency range [MHz]	2402 – 2480
	Channels	40
	Modulations	GFSK
	Maximum peak power [dBm]	0.21
	Maximum transmission duty cycle [%]	100

2 Result Summary

FCC 47 CFR Part 2.1093, KDB447498, IC RSS-102			
Product Specific Standard Section	Requirement	Result	Remarks
47 CFR 2.1093 KDB447498	SAR evaluation exemption : Bluetooth LE	PASS	
RSS-102 2.5.1	SAR evaluation exemption : Bluetooth LE	PASS	
Remarks:			

3 RF-Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)

Exposure Categories	
Occupational / Controlled	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 population / uncontrolled	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 Assessment

4.1 SAR Exemption Assessment –FCC KDB447498 / RSS-102

Low Power Exclusion acc. to FCC KDB447498 / IC RSS-102		Verdict: PASS
Assessment according to reference	Reference Method	
	KDB447498 & 2.1093 / RSS-102 & Safety Code 6	
Device type	portable	
Exposure category	General population	
FCC/IC SAR Limits		
Region	Occupational SAR values [W/kg]	General public SAR values [W/kg]
Whole-body SAR averaging mass = entire body	0.4	0.08
Partial-body SAR averaging mass = 1g	8.0	1.6
Hands, Wrists, Feet and Ankles SAR averaging mass = 10g	20	4
FCC SAR test exclusion		
<p>Excerpt from KDB 447498:</p> <p>Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition, listed below, is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.</p> <p>The minimum test separation distance is determined by the smallest distance from the antenna and radiating structures or outer surface of the device, according to the host form factor, exposure conditions and platform requirements, to any part of the body or extremity of a user or bystander</p> <p>The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at <i>test separation distances ≤ 50 mm</i> are determined by:</p> $\frac{\text{max. power of channel [mW]}}{\text{min. test separation distance [mm]}} \cdot \sqrt{f[\text{GHz}]} \leq \begin{cases} 3.0 & 1g \text{ SAR} \\ 7.5 & 10g \text{ SAR} \end{cases}$ <ul style="list-style-type: none"> ▪ f [GHz] is the RF channel transmit frequency in GHz ▪ Power and distance are rounded to the nearest mW and mm before calculation ▪ The result is rounded to one decimal place for comparison <p>The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.</p>		

IC SAR evaluation exemptions

Excerpt from RSS-102 Issue 4:

SAR evaluation is required if the separation distance between the user and the radiating element of the device is **less than or equal to 20 cm**, **except** when the device operates as follows:

from **3 kHz up to 1 GHz** inclusively, and with **output power** (i.e. the higher of the conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 200 mW for general public use** and **1000 mW for controlled use**;

above 1 GHz and up to 2.2 GHz inclusively, and with **output power** (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 100 mW for general public use** and **500 mW for controlled use**;

above 2.2 GHz and up to 3 GHz inclusively, and with **output power** (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 20 mW for general public use** and **100 mW for controlled use**;

above 3 GHz and up to 6 GHz inclusively, and with **output power** (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is **less than or equal to 10 mW for general public use** and **50 mW for controlled use**.

Assessment procedure

For the radiation source included into the device the output power is taken from a corresponding RF test report. If needed the output power is converted to source based, time-averaged output power. Finally the output power is compared to the FCC and IC low power SAR evaluation exemption level.

Assessment results – Bluetooth LE	
Transmission mode	
Operating mode frequency range [MHz]	2402 – 2480
Assessment frequency [MHz]	2402
Transmission duty cycle [%]	100
Peak conducted power [dBm]	0.21
Minimum separation distance [mm]	5.0
Source-based, time averaged power	
Duty cycle correction [dB]	0.00
Averaged conducted power [dBm]	0.21
Averaged conducted power [mW]	1.05
SAR evaluation exemption power levels	
FCC SAR test exclusion condition	$1.05[\text{mW}]/5.0[\text{mm}] \cdot \sqrt{2.402 [\text{GHz}]} = 0.3 \leq 3.0 \rightarrow \text{PASS}$
IC SAR test exclusion condition	$1.05 \text{ mW} \leq 20 \text{ mW} \rightarrow \text{PASS}$
Verdict	
The source-based, time-averaged output power of the EUT fulfills the SAR test exclusion requirements according to FCC KDB447498 and IC RSS-102	
Comments:	