

RF-EXPOSURE ASSESSMENT REPORT

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

RF-Exposure evaluation of portable equipment

Report Reference No. : G0M-1204-1920-TFC093M-V01

Testing Laboratory : Eurofins Product Service GmbH

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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 : Panasonic Industrial Devices Europe GmbH

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Test specification:

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

Equipment under test (EUT):

Product description	Bluetooth Low Energy Module	
Model No.	ENW898xxAxKF	
Hardware version	0x	
Firmware / Software version	0x	
	FCC-ID: T7VPAN17	IC: 216Q-PAN17

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..... : 2012-05-02

Date (s) of assessment..... : 2012-06-21

Compiled by..... : Christian Weber

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

Approved by (+ signature)..... : Jens Zimmermann
 (Test Lab Manager)

Date of issue..... : 2012-06-21

Total number of pages : 11

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J. Zimmermann

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:

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1 Equipment (Test item) Description

Description	Bluetooth Low Energy Module
Model	ENW898xxAxKF
Serial number	None
Hardware version	0x
Software / Firmware version	0x
FCC-ID	T7VPAN17
IC	216Q-PAN17
Equipment type	Radio module

1.1 Reference Documents

Document type	Document No.	Issued by	Date
FCC 15.247 Radio Report	G0M-1204-1920-TFC247W-V01	Eurofins Product Service GmbH	2012-06-21

1.2 Radiation Sources

Mode #	Description	
Bluetooth 4.0 LE	Frequency range [MHz]	2402 – 2480
	Channels	40
	Modulations	GFSK
	Maximum conducted power [dBm]	-0.5
	Antenna gain [dBi]	0.9
	Maximum radiated power [dBm e.i.r.p.]	0.4
	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 4.0 Low Energy	PASS	
RSS-102 2.5.1	SAR evaluation exemption : Bluetooth 4.0 Low Energy	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

MPE Assessment 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 evaluation exemptions		
<p><u>Excerpt from KDB 447498:</u></p> <p>Unlicensed intentional radiators and licensed devices can be approved as either a transmitter or a module for use in stand-alone portable exposure conditions that do not allow simultaneous transmission. Based on the SAR or output power level, the following three conditions may be applied;</p> <p>A device may be used in portable exposure conditions with no restrictions on host platforms when either the source-based time-averaged output power is $\leq 60/f(\text{GHz}) \text{ mW}$ or all measured 1-g SAR are $< 0.4 \text{ W/kg}$. When SAR evaluation is required, the most conservative exposure conditions for all expected operating configurations must be tested.</p> <p>A device may be approved for use in multiple host platforms, each with similar family attributes, for example, PDA, laptop/notebook/netbook computers, and tablet computers, when each host platform is tested in the most conservative exposure conditions and the 1-g SAR is $< 0.8 \text{ W/kg}$ for all configurations.</p> <p>A device may be approved for use in a single platform when all hosts within the same platform have the same operating configurations and exposure conditions, with only minor configuration and construction differences. The most conservative exposure conditions among all host configurations within the platform must be fully tested using the procedures in item 2) b) according to the required platform test configurations, such as those in item 4); the remaining less restrictive exposure conditions and host configurations may apply. The 1-g SAR must be $< 1.2 \text{ W/kg}$ for all configurations.</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 4.0 LE	
Transmission mode	
Operating mode frequency range [MHz]	2402-2480
Assessment frequency [MHz]	2480
Transmission duty cycle [%]	100
Peak conducted power [dBm]	-0.5
Source-based, time averaged power	
Duty cycle correction [dB]	0.0
Averaged peak power [dBm]	-0.5
Averaged radiated power	
Antenna gain [dBi]	0.9
Averaged radiated power [dBm e.i.r.p.]	0.4
SAR evaluation exemption power levels	
FCC 60/f(GHz)	$60/2.480 = 24.194 \text{ mW (13.84 dBm)}$
IC	20 mW (13.0 dBm)
Verdict	
The source-based, time-averaged output power of the EUT fulfills the SAR evaluation exemption requirements according to FCC KDB447498 and IC RSS-102	
Comments:	