

Exposure Calculation Report

Silicon Laboratories Finland Oy



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Main Model: SiW917Y1GA
Series Model: SiW917Y1GN

In accordance with ISED RSS-102

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ISED Accreditation

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EXECUTIVE SUMMARY

The calculation of output power for this product was found to be exempt from routine evaluation at a distance of 45 mm with ISED RSS-102 Iss 5, Amd 1 (2021-02) assuming continuous exposure of 6 minutes or more when used in a Portable Mode, and compliant at a minimum distance of 200 mm when used in a Mobile Mode. If alternative antennas are used with greater gains, the distance must be recalculated.



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1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	27-August-2024
2	Correction to a limit value in Table 4	28-August-2024

Table 1

1.2 Introduction

Applicant	Silicon Laboratories Finland Oy
Manufacturer	Silicon Laboratories Finland Oy
Model Number(s)	Main Model SiW917Y1GA Series Model: SiW917Y1GN
Hardware Version(s)	1.0
Software Version(s)	Stack's "Connectivity Firmware" version 2.10.1.2.0.4 (WLAN) Stack's "Connectivity Firmware" version 2.12.1.0.0.1 (BLE)
Specification/Issue/Date	RSS-102 Issue 5 Amendment 1 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Order Number	PTP ~ 6000530772
Date	08-March-2024
Related Document(s)	- Health Canada Safety Code 6:2015 - IEEE C95.3:2002 IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields with Respect to Human Exposure to Such Fields, 100 kHz–300 GHz

1.3 Brief Summary of Results

The wireless device described within this report was compliant with ISED RSS-102 Issue 5 Amd 1: Exemption Limits for Routine Evaluation – SAR Evaluation (RSS-102 Section 2.5.1) and RF Exposure Evaluation (RSS-102 Section 2.5.2).

The calculations shown in this report were made in accordance with the procedures specified in the applied test specification(s).

The report has two test tables for the device in a “Mobile Mode” at distances greater than 20 cm and “Portable Mode” at distances less than 20 cm.

Portable mode calculations have been performed to RSS-102 2.5.1 SAR Evaluation and used these limits to find the minimum separation distance.

Mobile mode calculations have been performed to RSS-102 2.5.2 RF Exposure Evaluation.

1.4 Product Information

1.4.1 Technical Description

Bluetooth Low Energy (LE), and Wi-Fi 802.11b/g/n/ax wireless radio module.

1.4.2 Transmitter Description

The following radio access technologies and frequency bands are supported by the equipment under test.

Radio Access Technology	Frequency Band (MHz)	Minimum Frequency (MHz)	Output Power (dBm)	Duty Cycle (%)
BLE	2402 – 2480	2402	16.18	100
WLAN	2412 – 2462	2412	20.69	100

Table 2 – Transmitter Description

1.4.3 Antenna Description

The following antennas are supported by the equipment under test.

Antenna Model	Gain (dBi)	Antenna length (cm)
Integral Antenna	2.26	1.4
ANT-2.4-CW-CT-SMA-RPS by TE Connectivity	2.80	14.2

Table 3 – Antenna Description

In the case of more than one type of antenna being supported by the equipment, the calculation is based on the maximum of the antenna gains. If other antennas can be used that have greater gains, the minimum separation distances will need to be recalculated.

1.4.4 Equipment Configuration

Single Transmitter, simultaneous transmission of BLE and WLAN is not supported



2 Assessment Details

2.1 Configuration – Portable Mode Transmitter 10 MHz to 300 GHz – Separation Distance of ≤200 mm

The RF exposure evaluation exemption is determined by comparison of the output power level (adjusted for tune-up tolerance) to the requirements given in RSS-102 2.5.1. Minimum separation distance has been found for each technology and antenna combination.

RAT	Frequency (MHz)	Power Output mW	Antenna Gain Ratio	Duty Cycle %	Maximum Power EIRP (Tune up Value) * (mW)	Test Separation Distance (mm) **	Exemption Limit *** (mW)	RF Evaluation Exclusion (Yes/No)
BLE (ext. ant.)	2480	41.495	1.905	100	79.068	30	83	Yes
WLAN (ext. ant.)	2462	117.220	1.905	100	223.357	45	235	Yes
BLE (int. ant.)	2480	41.495	1.683	100	69.823	30	83	Yes
WLAN (int. ant.)	2462	117.220	1.683	100	197.242	45	235	Yes

Table 4

* Maximum power tune up value is adjusted for any tolerance and is the equivalent isotropically radiated power (EIRP) source-based, time-averaged output power of the device.

**Test separation distance refers to the minimum test separation distance based on the smallest distance between the antenna and radiating structures or the outer surface of the device, according to the most conservative exposure condition for the applicable module or host platform test procedure requirements, to any part of the body or extremity of a user or bystander.

*** Select power from RSS-102 Table 11 for the applicable frequency and separation distance. For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in Table 1, linear interpolation shall be applied for the applicable separation distance.

The RF exposure exclusion threshold has been evaluated using the method described above from information supplied by the manufacturer. Based on the evaluation above, the EUT is categorically excluded from RF exposure testing for a separation distance greater than or equal to those stated in the table above.

2.2 Configuration – Mobile Mode Transmitter up to 6 GHz – Separation Distance >200 mm

The RF exposure evaluation exemption is determined by comparison of the output power level (adjusted for tune-up tolerance) to the requirements given in RSS-102 2.5.2.

RAT	Frequency (MHz)	Power Output mW	Antenna Gain Ratio	Duty Cycle %	Maximum Power EIRP (Tune up Value) * (mW)	Test Separation Distance (mm) **	Exemption Limit *** (mW)	RF Evaluation Exclusion (Yes/No)
BLE (ext. ant.)	2402.000	41.495	1.905	100	79.068	200.1	2676.4	Yes
WLAN (ext. ant.)	2412.000	117.220	1.905	100	223.357	200.1	2684.0	Yes
BLE (int. ant.)	2402.000	41.495	1.683	100	69.823	200.1	2676.4	Yes
WLAN (int. ant.)	2412.000	117.220	1.683	100	197.242	200.1	2684.0	Yes

Table 5

* Maximum power tune up value is adjusted for any tolerance and is the equivalent isotropically radiated power (EIRP) source-based, time-averaged output power of the device.

**Test separation distance refers to the minimum test separation distance based on the smallest distance between the antenna and radiating structures or the outer surface of the device, according to the most conservative exposure condition for the applicable module or host platform test procedure requirements, to any part of the body or extremity of a user or bystander.

*** Select power from RSS-102 paragraph 2.5.2 for the applicable frequency.

The RF exposure exclusion threshold has been evaluated using the method described above from information supplied by the manufacturer. Based on the evaluation above, the EUT is categorically excluded from RF exposure testing.