

RF Exposure Report

Report No.: MCCDBM-WTW-P22060902

IC: 5123A-GM240S

Test Model: MGM240S22A

Series Model: BGM240S22A

Received Date: Jul. 06, 2022

Date of Evaluation: Jul. 15 ~ Jul. 29, 2022

Issued Date: Oct. 10, 2022

Applicant: Silicon Laboratories Finland Oy

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ISED# / CAB Identifier: 7450F / TW2021



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Release Control Record

Issue No.	Description	Date Issued
MCCDBM-WTW-P22060902	Original Release	Oct. 10, 2022

1 Certificate of Conformity

Product: Bluetooth Low Energy and 802.15.4 wireless radio module

Brand: SILICON LABS

Test Model: MGM240S22A

Series Model: BGM240S22A

Sample Status: Engineering samples fully representing the production modules

Applicant: Silicon Laboratories Finland Oy

Date of Evaluation: Jul. 15 ~ Jul. 29, 2022

Standards: RSS-102 Issue 5 (March 19, 2015), Amendment 1 (February 2, 2021)

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Polly Chien , **Date:** Oct. 10, 2022
Polly Chien / Specialist

Approved by : Jeremy Lin , **Date:** Oct. 10, 2022
Jeremy Lin / Project Engineer

2 RF Exposure

2.1 Limits For Maximum Permissible Exposure (MPE)

Per RSS-102 issue 5, section 2.5.2 as reproduced below:

2.5.2 Exemption from Routine Evaluation Limits – RF Exposure Evaluation

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $22.48/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.

Frequency Range (MHz)	Electric Field Strength (V/m rms)	Magnetic Field Strength (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
Limits For General Population / Uncontrolled Exposure				
0.003-10 ²¹	83	90	-	Instantaneous*
0.1-10	-	$0.73/f$	-	6**
1.1-10	$87/f^{0.5}$	-	-	6**
10-20	27.46	0.0728	2	6
20-48	$58.07/f^{0.25}$	$0.1540/f^{0.25}$	$8.944/f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	$3.142 f^{0.3417}$	$0.008335 f^{0.3417}$	$0.02619 f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	$616000/f^{1.2}$
150000-300000	$0.158 f^{0.5}$	$4.21 \times 10^{-4} f^{0.5}$	$6.67 \times 10^{-5} f$	$616000/f^{1.2}$

Note: f is frequency in MHz.
*Based on nerve stimulation (NS).
** Based on specific absorption rate (SAR).

2.2 MPE CALCULATION FORMULA

$$Pd = (Pout * G) / (4 * \pi * r^2)$$

where

Pd = power density in W/m²

Pout = output power to antenna in W

G = gain of antenna in linear scale

$\pi = 3.1416$

r = distance between observation point and center of the radiator in m

2.3 CLASSIFICATION

The antenna of this product, under normal use condition, is at greater than 0.2m away from the body of the user. So, this device is classified as Mobile Device.

2.4 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

Operation Mode	Frequency Band (MHz)	Average Power (W)	Antenna Gain (dBi)	Maximum EIRP (W)	Distance (m)	Exemption Limit (W)	Test Result
1MBaud PHY with 1Mbps	2402-2480	0.010814	2.8	0.020606	0.2	2.735517	Pass
802.15.4	2405-2480	0.010789	2.8	0.020558	0.2	2.735517	Pass

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. BT LE and 802.15.4 modes technology cannot transmit at same time.
3. The antenna information is listed as below.

No.	Type	Connector	Gain (dBi)	Remark
1	Integral antenna	NA	1.48	-
2	External reference dipole antenna**	SMA Male	2.80	-

* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

** The dipole antenna is not sold with the EUT, but is used during testing as a reference antenna for radiated measurements of the parts making use of the RF pin.

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