

## RF Exposure Report

**Report No.:** SACDBM-WTW-P22030865-1

**IC:** 5123A-GM240P

**Test Model:** MGM240P22A, MGM240P32A, MGM240P32N

**Series Model:** BGM240P22A, BGM240P32A, BGM240P32N

**Received Date:** Mar. 22, 2022

**Date of Evaluation:** May 12, 2022

**Issued Date:** Aug. 15, 2022

**Applicant:** Silicon Laboratories Finland Oy

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch  
Lin Kou Laboratories

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**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
33383, TAIWAN

**ISED# / CAB Identifier:** 7450F / TW2021



This report is governed by, and incorporates by reference, the Conditions of Testing as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. Statements of conformity are based on simple acceptance criteria without taking measurement uncertainty into account, unless otherwise requested in writing. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

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**Release Control Record**

Issue No.	Description	Date Issued
SACDBM-WTW-P22030865-1	Original Release	Aug. 15, 2022

## 1 Certificate of Conformity

**Product:** Bluetooth Low Energy and 802.15.4 wireless radio module

**Brand:** Silicon Labs

**Test Model:** MGM240P22A, MGM240P32A, MGM240P32N

**Series Model:** BGM240P22A, BGM240P32A, BGM240P32N

**Sample Status:** Engineering samples fully representing the production modules

**Applicant:** Silicon Laboratories Finland Oy

**Date of Evaluation:** May 12, 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 :** Gina Liu, **Date:** Aug. 15, 2022

Gina Liu / Specialist

**Approved by :** Jeremy Lin, **Date:** Aug. 15, 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 <sup>2</sup> )	Reference Period (minutes)
Limits For General Population / Uncontrolled Exposure				
0.003-10 <sup>21</sup>	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/m<sup>2</sup>

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

Mode	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (m)	Power Density (W/m <sup>2</sup> )	Limit (W/m <sup>2</sup> )
BT Low Energy (DTS) / integral antenna						
A	2402-2480	10.05	1.82	0.2	0.031	5.351
B	2402-2480	19.69	1.82	0.2	0.282	5.351
BT Low Energy (Hopping) / integral antenna						
B	2402-2480	19.69	1.82	0.2	0.282	5.351
802.15.4 / integral antenna						
A	2405-2480	10.05	1.82	0.2	0.031	5.355
B	2405-2480	19.58	1.82	0.2	0.275	5.355
BT Low Energy (DTS) / dipole antenna						
C	2402-2480	19.62	2.80	0.2	0.347	5.351
BT Low Energy (Hopping) / dipole antenna						
C	2402-2480	19.62	2.80	0.2	0.347	5.351
802.15.4 / dipole antenna						
C	2405-2480	19.66	2.80	0.2	0.351	5.355

Note:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- There're 3 mode for the EUT listed as below.  
 Mode A: MGM240P22A  
 Mode B: MGM240P32A  
 Mode C: MGM240P32N
- BT LE (DTS/FHSS) and 802.15.4 modes technology cannot transmit at same time.
- The antenna information is listed as below.

No.	Type	Connector	Gain (dBi)	Remark
1	Integral antenna	NA	1.82	For model: MGM240P22A, MGM240P32A, BGM240P22A, BGM240P32A
2	External reference dipole antenna**	RP-SMA	2.80	For model: MGM240P32N, BGM240P32N

\* 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 with the RF pin.

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