

## RF Exposure Report

(Portable mode)

**Report No.:** SFCDBM-WTW-P22030865

**FCC ID:** QOQ-GM240P

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

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

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

**Test Date:** Jun. 22, 2022

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

**Applicant:** Silicon Laboratories Finland Oy

**Address:** Alberga Business Park - Bldg D/Floor 5, Bertel Jungin aukio 3, 02600  
ESPOO, FINLAND

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

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

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

**FCC Registration /  
Designation Number:** 788550 / TW0003



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.

## Table of Contents

<b>Release Control Record</b> .....	<b>3</b>
<b>1 Certificate of Conformity</b> .....	<b>4</b>
<b>2 Evaluation Result</b> .....	<b>5</b>
<b>3 Duty Cycle of Test Signal</b> .....	<b>6</b>
<b>4 SAR Test Exclusion Thresholds</b> .....	<b>9</b>



### Release Control Record

Issue No.	Description	Date Issued
SFCDBM-WTW-P22030865	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 production modules

**Applicant:** Silicon Laboratories Finland Oy

**Test Date:** Jun. 22, 2022

**Standards:** FCC Part 2 (Section 2.1093)

**References Test Guidance:** KDB 447498 D04 Interim General RF Exposure Guidance v01

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 Evaluation Result

Following KDB 447498 D04 Interim "General RF Exposure Guidance v01"

The corresponding SAR Exclusion Threshold condition, listed below:

According to KDB 447498 D04, the SAR-based thresholds are derived based on the frequency, power, and separation distance of the RF source. The formula below is defined the thresholds in general for either available maximum time-averaged power or maximum time-averaged (ERP), whichever is greater. The SAR exclusion threshold is determined by the following formula.

1. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequency from 0.3 GHz to 6 GHz (inclusive).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

### Note:

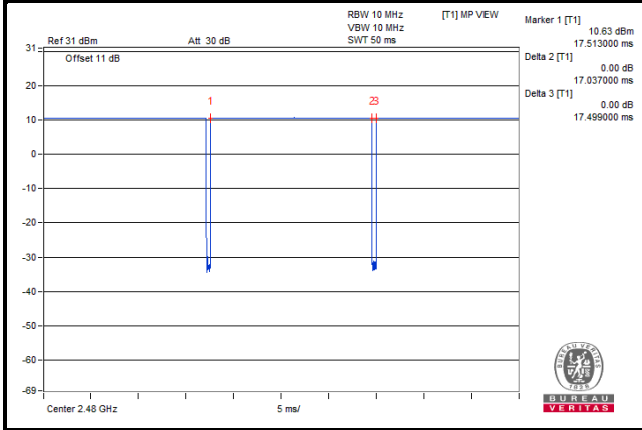
1. When the device output power is less than the power threshold shown in above table, the SAR testing exclusion is applied.
2. Units for  $d$  are cm and units for  $f$  are GHz.

### 3 Duty Cycle of Test Signal

#### Mode A

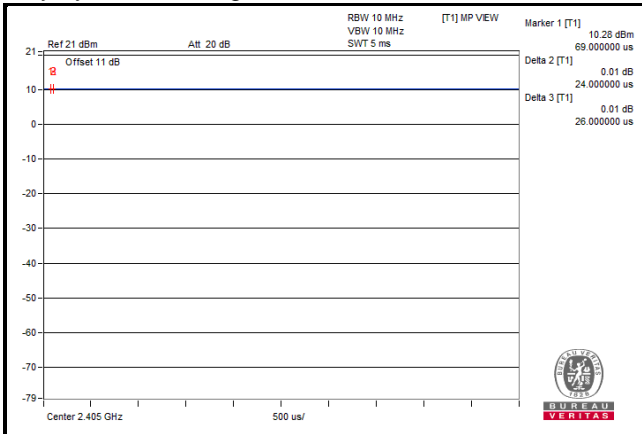
#### <Bluetooth Low Energy>

Duty cycle =  $17.037/17.499 = 0.9736$ , Duty factor =  $10 * \log(1/0.9736) = 0.12$



#### <802.15.4>

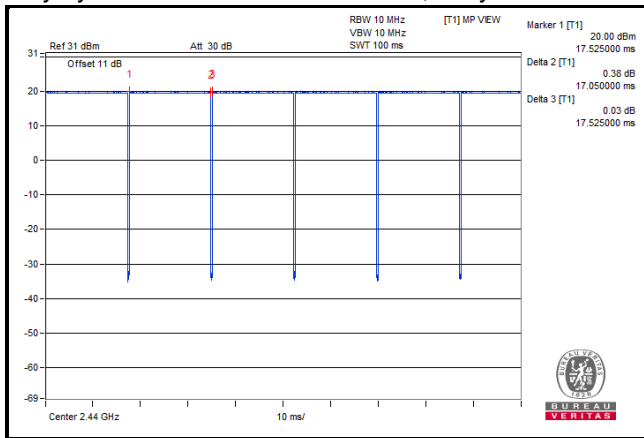
Duty cycle of test signal is 100 %



## Mode B

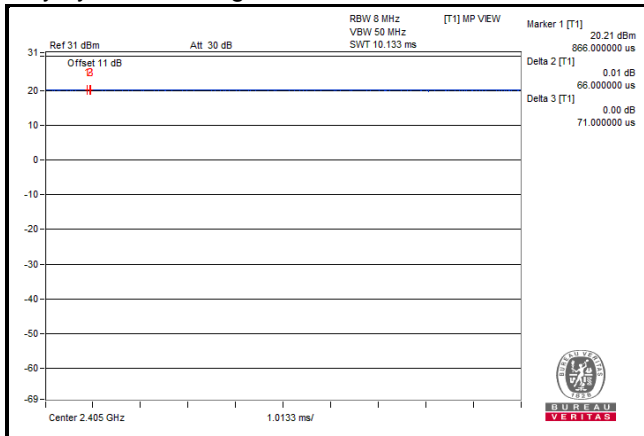
### <Bluetooth Low Energy>

Duty cycle =  $17.05/17.525 = 0.9729$ , Duty factor =  $10 * \log(1/0.9729) = 0.12$



### <802.15.4>

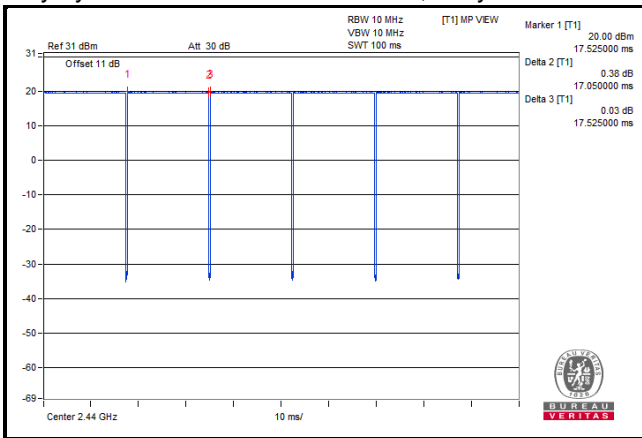
Duty cycle of test signal is 100 %



### Mode C

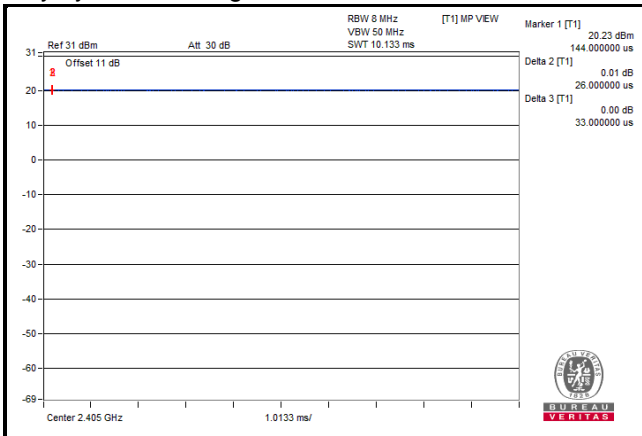
#### <Bluetooth Low Energy>

Duty cycle =  $17.05/17.525 = 0.9729$ , Duty factor =  $10 * \log(1/0.9729) = 0.12$



#### <802.15.4>

Duty cycle of test signal is 100 %





#### 4 SAR Test Exclusion Thresholds

Mode	FCC	Antenna Gain (dBi)	Power	Duty Cycle	Max Calculated Power or Max ERP(dBm)	SAR exemption minimum distances (mm)	Result
A	Bluetooth Low Energy	1.82	10.05dBm=10.1158mW	97.36%	$10.1158 \times 97.36\% = 9.84874288\text{mW} = 9.93381\text{dBm}$	9.9	Pass
	802.15.4	1.82	10.05dBm=10.1158mW	100%	10.05dBm	10	Pass
B	Bluetooth Low Energy	1.82	19.69dBm=93.111mW	97.29%	$93.111 \times 97.29\% = 90.5876919\text{mW} = 19.5707\text{dBm}$	31.6	Pass
	802.15.4	1.82	19.58dBm=90.7821mW	100%	19.58dBm	31.6	Pass
C	Bluetooth Low Energy	2.8	19.62dBm=91.622mW	97.29%	$91.622 \times 97.29\% = 89.1390438\text{mW} \rightarrow 19.5007\text{dBm} + 2.8 - 2.15 = 20.1507\text{dBm}$	33.9	Pass
	802.15.4	2.8	19.66dBm=92.4698mW	100%	$19.66\text{dBm} + 2.8 - 2.15 = 20.31\text{dBm}$	34.5	Pass

Note:

1. There're 3 mode for the EUT listed as below.

Mode A: MGM240P22A

Mode B: MGM240P32A

Mode C: MGM240P32N

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- Calculate SAR test exclusion thresholds from condition "1" formulas.
- The manufacturer reserves the right to further limit the max RF TX power in the firmware of production modules.
- That exclusion is based on the highest max tune up power (including tolerance).

---END---