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

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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).

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

Where

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

and

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

d = the separation distance (cm);

Note:

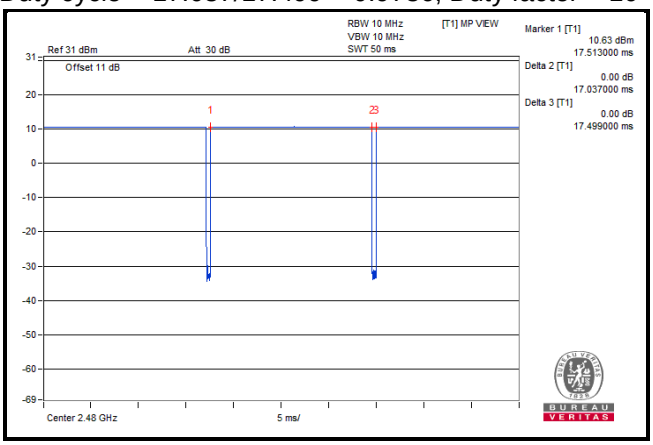
1. When the device output power is less than the power threshold shown in above table, the SAR testing exclusion is applied.
2. Units for d are cm and units for f are GHz.

3 Duty Cycle of Test Signal

Mode A

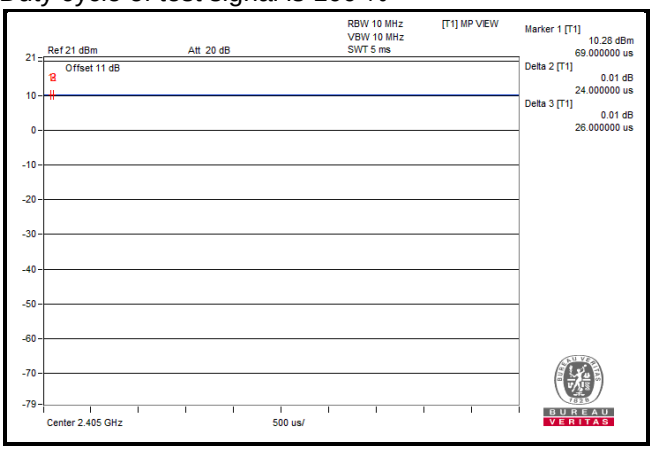
<Bluetooth Low Energy>

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



<802.15.4>

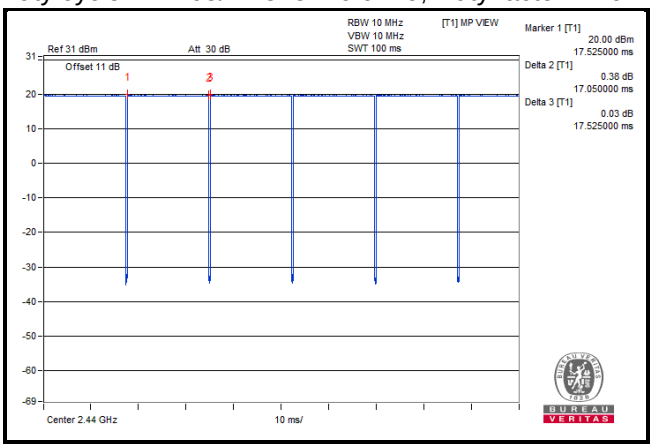
Duty cycle of test signal is 100 %



Mode B

<Bluetooth Low Energy>

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



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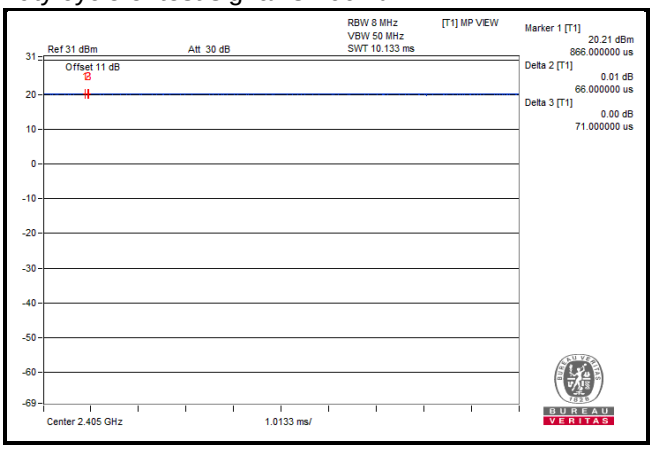
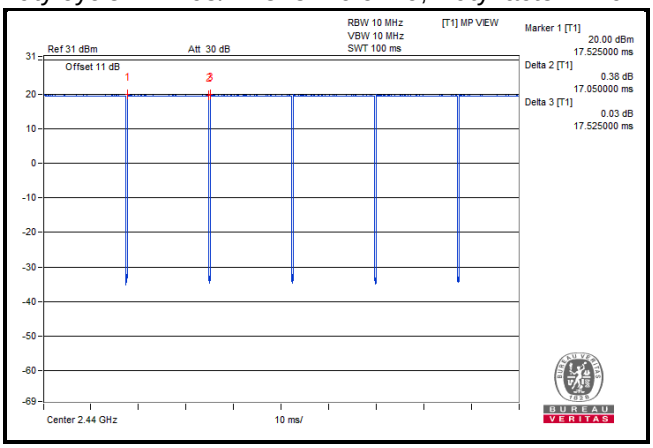
Duty cycle of test signal is 100 %



Mode C

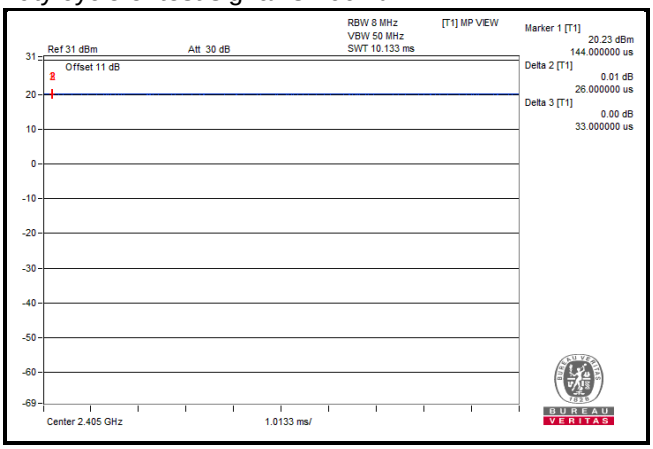
<Bluetooth Low Energy>

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*97.36%=9.84874288mW=9.93381dBm	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*97.29%=90.5876919mW=19.5707dBm	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*97.29%=89.1390438mW→19.5007dBm + 2.8 -2.15=20.1507 dBm	33.9	Pass
	802.15.4	2.8	19.66dBm=92.4698mW	100%	19.66dBm + 2.8 -2.15=20.31 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
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
3. Calculate SAR test exclusion thresholds from condition "1" formulas.
4. The manufacturer reserves the right to further limit the max RF TX power in the firmware of production modules.
5. That exclusion is based on the highest max tune up power (including tolerance).

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