

RF Exposure Report

(Portable mode)

Report No.: SCCDBM-WTW-P22030865

IC: 5123A-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

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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ISED# / CAB Identifier: 7450F / TW2021



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Release Control Record

Issue No.	Description	Date Issued
SCCDBM-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: 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 Limits for Maximum Permissible Exposure

Per draft RSS-102 issue 5, section 2.5.1 and 2.5.2 as reproduced below:

2.5.1 Exemption from Routine Evaluation Limits – SAR Evaluation

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in below table:

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of ≤ 5 mm	At separation distance of 10 mm	At separation distance of 15 mm	At separation distance of 20 mm	At separation distance of 25 mm
300	71 mW	101 mW	132 mW	162 mW	193 mW
450	52 mW	70 mW	88 mW	106 mW	123 mW
835	17 mW	30 mW	42 mW	55 mW	67 mW
1900	7 mW	10 mW	18 mW	34 mW	60 mW
2450	4 mW	7 mW	15 mW	30 mW	52 mW
3500	2 mW	6 mW	16 mW	32 mW	55 mW
5800	1 mW	6 mW	15 mW	27 mW	41 mW

Frequency (MHz)	Exemption Limits (mW)				
	At separation distance of 30 mm	At separation distance of 35 mm	At separation distance of 40 mm	At separation distance of 45 mm	At separation distance of ≥ 50 mm
300	223 mW	254 mW	284 mW	315 mW	345 mW
450	141 mW	159 mW	177 mW	195 mW	213 mW
835	80 mW	92 mW	105 mW	117 mW	130 mW
1900	99 mW	153 mW	225 mW	316 mW	431 mW
2450	83 mW	123 mW	173 mW	235 mW	309 mW
3500	86 mW	124 mW	170 mW	225 mW	290 mW
5800	56 mW	71 mW	85 mW	97 mW	106 mW

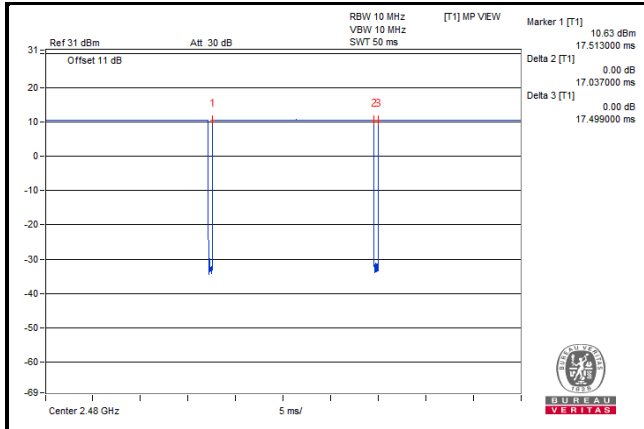
Output power level shall be the higher of the maximum conducted or equivalent isotropically radiated power (e.i.r.p.) source-based, time-averaged output power. For controlled use devices where the 8 W/kg for 1 g of tissue applies, the exemption limits for routine evaluation in Table 1 are multiplied by a factor of 5. For limb-worn devices where the 10 gram 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. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required. For medical implant devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implant device is defined as the higher of the conducted or e.i.r.p to determine if the device is exempt from the SAR evaluation.

3 Duty Cycle of Test Signal

Mode A

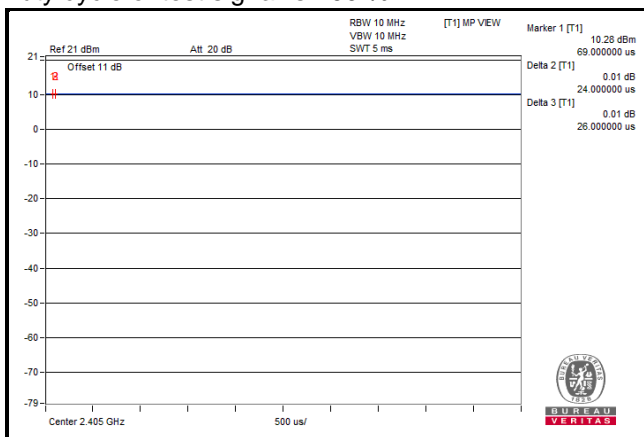
<Bluetooth Low Energy>

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



<802.15.4>

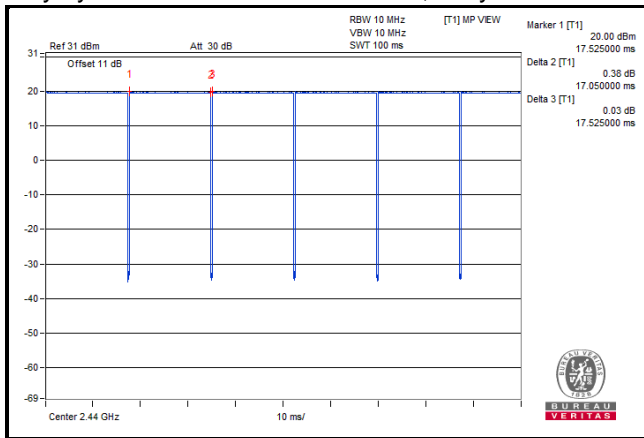
Duty cycle of test signal is 100 %



Mode B

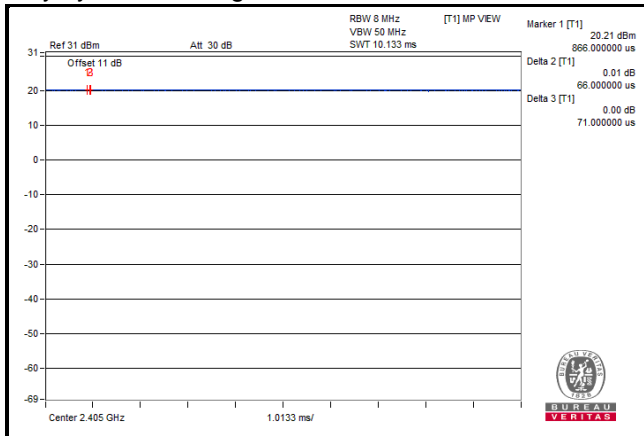
<Bluetooth Low Energy>

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 %



4 SAR Test Exclusion Thresholds

Mode	IC	Antenna Gain (dBi)	Power	Duty Cycle	Calculated Power	SAR exemption minimum distances (mm)
A	Bluetooth Low Energy	1.82	10.05dBm=10.1158mW	97.36%	$10.1158 \times 97.36\% = 9.84874288\text{mW} \rightarrow 9.93381\text{dBm} + 1.82 = 11.75381\text{dBm}$	15
	802.15.4	1.82	10.05dBm=10.1158mW	100%	$10.05\text{dBm} + 1.82 = 11.87\text{ dBm}$	15.2
B	Bluetooth Low Energy	1.82	19.69dBm=93.111mW	97.29%	$93.111 \times 97.29\% = 90.5876919\text{mW} \rightarrow 19.5707\text{dBm} + 1.82 = 21.3907\text{dBm}$	39.3
	802.15.4	1.82	19.58dBm=90.7821mW	100%	$19.58\text{dBm} + 1.82 = 21.4\text{ dBm}$	37
C	Bluetooth Low Energy	2.8	19.62dBm=91.622mW	97.29%	$91.622 \times 97.29\% = 89.1390438\text{mW} \rightarrow 19.5007\text{dBm} + 2.8 = 22.3007\text{dBm}$	40
	802.15.4	2.8	19.66dBm=92.4698mW	100%	$19.66\text{dBm} + 2.8 = 22.46\text{ dBm}$	41

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. The manufacturer reserves the right to further limit the max RF TX power in the firmware of production modules.

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