

RF Exposure Exemption Report

Silicon Laboratories Finland Oy

Main Model: MGM270S22A

Series Model: BGM270S22A

In accordance with FCC CFR 47 Part 1.1307

Prepared for: Silicon Laboratories Finland Oy
Bertel Jungin Aukio 3
Alberga Business Park
02600 Espoo
Finland



**Add value.
Inspire trust.**

COMMERCIAL-IN-CONFIDENCE

FCC ID: QOQ-GM270S

Document 75965039-09 Issue: 01

SIGNATURE

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Steve Marshall	Senior Engineer	Authorised Signatory	02 September 2025

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD document control rules.

FCC Accreditation
294497/UK2010 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

The wireless devices described within this report are compliant with the exemption criteria related to human exposure to electromagnetic fields laid out in FCC CFR Title 47 Part 1.1307.



DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TÜV SÜD with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD. No part of this document may be reproduced without the prior written approval of TÜV SÜD. © 2025 TÜV SÜD. This report relates only to the actual item/items tested.

ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

TÜV SÜD
is a trading name of TÜV SÜD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuvsud.com/en

TÜV SÜD
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom



Contents

1 Report Summary 2

1.1 Report Modification Record.....2

1.2 Introduction.....2

1.3 Brief Summary of Results 3

1.4 Application Form 4

1.5 Product Information 6

2 Assessment Details 8

2.1 Single RF Source Options for Determination of Exemption.....8

2.2 Individual Antenna Port Exposure Results.....9



1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	02-Sept-2025

Table 1

1.2 Introduction

Applicant	Silicon Laboratories Finland Oy
Manufacturer	Silicon Laboratories Finland Oy
Model Number(s)	Main Model: MGM270S22A Series Model: BGM270S22A
Hardware Version(s)	1.0
Software Version(s)	Simplicity SDK Suite v2025.6.0
Specification/Issue/Date	FCC 47 CFR Part 1.1307: 2022
Order Number	6000558262
Date	24-June-2025
Related Document(s)	• KDB 447498 D04 v01 • FCC 47 CFR Part 2.1091: 2023 (Mobile Mode) • FCC 47 CFR Part 2.1093: 2023 (Portable Mode)



1.3 Brief Summary of Results

The wireless devices described within this report are compliant with the exemption criteria related to human exposure to electromagnetic fields laid out in FCC CFR Title 47 Part 1.1307.

The calculations shown in this report were made in accordance with the procedures specified in the applied test specification(s).

The report has two result tables for the device, a "Mobile Mode" at distances greater than 20 cm and "Portable Mode" at distances lower than 20 cm.

Portable mode calculations have been performed to FCC 1.1307(b)(3)(i)(B) Option B (SAR Based Exemption).

Mobile mode calculations have been performed to FCC 1.1307(b)(3)(i)(C) 'Option C' (MPE Based Exemption).



1.4 Application Form

Equipment Description

Equipment Description

Technical Description: <i>(Please provide a brief description of the intended use of the equipment)</i>	Bluetooth Low Energy (LE) and 802.15.4 wireless radio module
Manufacturer:	Silicon Laboratories Finland Oy
Model Name(s):	Main Model: MGM270S22A (supports both BLE and 802.15.4) Series Model: BGM270S22A (supports only BLE – 802.15.4 disabled)
Brand Name:	SILICON LABS

Frequency Band 1: BLE

Antenna Brand / Model Names:	[1] Integral PCB Trace Antenna: SILICON LABS / GM270S or [2] External Reference Dipole Antenna (not sold with modules): TE Connectivity / ANT-2.4-CW-CT-SMA-RPS	
Antenna length:	[1] 6.3 [2] 142	mm
Bottom frequency:	2402	MHz
Middle frequency:	2440	MHz
Top frequency:	2480	MHz

Maximum power (input to the antenna including a tolerance):	6.3	dBm
Antenna gain (or maximum gain allowed):	[1] 1.74 [2] 2.80	dBi

Or

Field Strength Measurement:		dBμA/M
Measurement Distance:		cm

Separation distance from antenna to the user/bystander	Mobile Mode: 20 Portable Mode: (to be calculated for the exemption)	cm
Transmitter Duty Cycle:	BLE Legacy Adv Mode: 5 Data Mode: 98	%



Frequency Band 2: 802.15.4

Antenna Brand / Model Names:	[1] Integral PCB Trace Antenna: SILICON LABS / GM270S or [2] External Reference Dipole Antenna (not sold with modules): TE Connectivity / ANT-2.4-CW-CT-SMA-RPS	
Antenna length:	[1] 6.3 [2] 142	mm
Bottom frequency:	2405	MHz
Middle frequency:	2445	MHz
Top frequency:	2480	MHz

Maximum power (input to the antenna including a tolerance):	6.3	dBm
Antenna gain (or maximum gain allowed):	[1] 1.74 [2] 2.80	dBi

Or

Field Strength Measurement:		dBμA/M
Measurement Distance:		cm

Separation distance from antenna to the user/bystander	Mobile Mode: 20 Portable Mode: (to be calculated for the exemption)	cm
Transmitter Duty Cycle:	100	%

Data in the tables above is provided by the Manufacturer



1.5 Product Information

1.5.1 Technical Description

Bluetooth Low Energy (LE) and 802.15.4 wireless radio module.

1.5.2 Transmitter Description

The following radio access technologies and frequency bands are supported by the equipment under test.

Radio Access Technology	Operating Frequency Range (MHz)	Minimum Frequency (MHz)	Output Power (dBm)	Duty Cycle (%)
BLE	2402 – 2480	2402	6.3	98
802.15.4	2405 - 2480	2405	6.3	100

Table 2 - Transmitter Description – FCC (Main Model: MGM270S22A)

Radio Access Technology	Operating Frequency Range (MHz)	Minimum Frequency (MHz)	Output Power (dBm)	Duty Cycle (%)
BLE	2402 - 2480	2402	6.3	98

Table 3 - Transmitter Description – FCC (Series Model: BGM270S22A)

Notes:

Transmitter power includes upper bounds of uncertainty therefore maximum values are used.
The worst case has been taken as the minimum transmit frequency and highest duty cycle per technology

The following antennas are supported by the equipment under test.

Radio Access Technology	Antenna Model	Gain (dBi)	Antenna Length (cm)
BLE (int.ant.)	Silicon Labs GM270S	1.74	0.63
802.15.4 (int.ant.)	Silicon Labs GM270S	1.74	0.63
BLE (ext.ant.)	TE Connectivity ANT_2.4_CW_CT_SMA_RPS	2.80	14.2
802.15.4 (ext.ant.)	TE Connectivity ANT_2.4_CW_CT_SMA_RPS	2.80	14.2

Table 4 - Antenna Description: (Main Model: MGM270S22A & Series Model: BGM270S22A)

In the case of more than one type of antenna being supported by the equipment, the calculation is based on the maximum of the antenna gains. If other antennas can be used that have greater gains, the minimum separation distances will need to be recalculated.

Note: Antenna gain includes upper bounds of uncertainty therefore maximum values are used.

1.5.3 Equipment Configuration

The devices supports the following modes:-

The Main Model: MGM270S22A supports the following Modes:

- BLE
- 802.15.4

The device does not support simultaneous transmissions of these wireless protocols.

The Series Model: BGM270S22A supports the following Modes:

- BLE



2 Assessment Details

2.1 Single RF Source Options for Determination of Exemption

Option	Reference	RF Exposure Test Exemptions for Single Source												
A (1-mW Test Exemption)	FCC 1.1307(b)(3)(i)(A)	The available maximum time averaged power is no more than 1 mW, regardless of separation distance.												
B (SAR-Based Exemption)	FCC 1.1307(b)(3)(i)(B)	The available maximum timeaveraged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by: $P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$ Where $x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$ and $ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$ <i>d</i> = the separation distance (cm);												
C (MPE-Based Exemption)	FCC 1.1307(b)(3)(i)(C)	Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least λ/2π, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole (1.64 linear value). TABLE 1 TO § 1.1307(b)(3)(i)(C)—SINGLE RF SOURCES SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION <table><tr><th>RF Source frequency (MHz)</th><th>Threshold ERP (watts)</th></tr><tr><td>0.3–1.34</td><td>1,920 R².</td></tr><tr><td>1.34–30</td><td>3,450 R²/f².</td></tr><tr><td>30–300</td><td>3.83 R².</td></tr><tr><td>300–1,500</td><td>0.0128 R²f.</td></tr><tr><td>1,500–100,000</td><td>19.2R².</td></tr></table>	RF Source frequency (MHz)	Threshold ERP (watts)	0.3–1.34	1,920 R ² .	1.34–30	3,450 R ² /f ² .	30–300	3.83 R ² .	300–1,500	0.0128 R ² f.	1,500–100,000	19.2R ² .
RF Source frequency (MHz)	Threshold ERP (watts)													
0.3–1.34	1,920 R ² .													
1.34–30	3,450 R ² /f ² .													
30–300	3.83 R ² .													
300–1,500	0.0128 R ² f.													
1,500–100,000	19.2R ² .													

Table 5



2.2 Individual Antenna Port Exposure Results

2.2.1 Single Source Calculation of Exposure at Specified Separation Distance FCC 1.1307(b)(3)(i)(B) 'Option B' (SAR Based Exemption)

RAT	Frequency (MHz)	Conducted Power Output mW	Duty Cycle %	Time Average Conducted Power Output mW	Antenna Gain Ratio	Maximum Power (EIRP) mW	Maximum Power (ERP) mW	Minimum Antenna to User Separation Distance (mm)	Pth (mW) 1.1307 (b)(3)(i)(B)	Greater of Max time averaged conducted power or ERP?	1.1307(b)(3)(i)(B) Exemption (Yes/No) (300 MHz to 6 GHz, 0.5 cm to 20 cm)
BLE (int.ant.)	2402	4.27	98	4.18	1.49	6.24	3.81	7	5.3	4.18	Yes
BLE (ext.ant.)	2402	4.27	98	4.18	1.91	7.97	4.86	7	5.3	4.18	Yes
802.15.4 (int.ant.)	2405	4.27	100	4.27	1.49	6.37	3.88	7	5.3	4.27	Yes
802.15.4 (ext.ant.)	2405	4.27	100	4.27	1.91	8.13	4.96	7	5.3	4.96	Yes

Table 6 - Transmitter Result: Portable Mode

The calculations show that the individual transmitters comply with FCC 1.1307(b)(3)(i)(B) SAR-based exemption at a minimum distance of 7 mm.

2.2.2 Single Source Calculation of Exposure at Specified Separation Distance FCC 1.1307(b)(3)(i)(C) 'Option C' (MPE Based Exemption)

RAT	Frequency (MHz)	Conducted Power Output mW	Duty Cycle %	Time Average Conducted Power Output mW	Antenna Gain Ratio	Maximum Power (EIRP) mW	Maximum Power (ERP) mW	Minimum separation distance for MPE evaluation $\lambda/2$ π mm	Actual Distance (mm)	Threshold ERP (mW)	1.1307(b)(3)(i)(C) Exemption (Yes/No) (300 kHz to 100 GHz)
BLE (int.ant.)	2402	4.27	98	4.18	1.49	6.24	3.81	19.9	200	768	Yes
802.15.4 (int.ant.)	2402	4.27	98	4.18	1.91	7.97	4.86	19.9	200	768	Yes
BLE (ext.ant.)	2405	4.27	100	4.27	1.49	6.37	3.88	19.9	200	768	Yes
802.15.4 (ext.ant.)	2405	4.27	100	4.27	1.91	8.13	4.96	19.9	200	768	Yes

Table 7 - Transmitter Result: Mobile Mode

The calculations show that the individual transmitters comply with FCC 1.1307(b)(3)(i)(C) MPE-based exception at a minimum distance of 200 mm.