TÜV SÜD, Octagon House,
Concorde Way, Segensworth North, Fareham,
Hampshire, United Kingdom, PO15 5RL
Tel: +44 (0) 1489 558100
Website: www.tuv-sud.co.uk

SAR EXCLUSION DOCUMENT (MOBILE)

Document 75947809-10 Issue 01

2.4 GHz BT Transmitter:

FCC Standalone SAR Test Exclusion Considerations (KDB 447498 D01) Section 4.3.1 b)

100 MHz – 6 GHz – Separation Distance >50 mm

The SAR Test exclusion thresholds for 1500 MHz to 6 GHz test separation distances >50 mm are determined by:

Step a) Threshold result from Formula in Section 4.3.1 a):

The Step a) formula has to be re-arranged to give power allowed at numeric threshold at 50 mm test separation distance as required by Step b):

Power Allowed at Numeric Threshold = {(Numeric Threshold / $\sqrt{f_{(GHz)}}$) x 50 mm Separation Distance} mW

- Numeric threshold = 3 for Head/Body or 7.5 for Extremities
- f (GHz) is the RF channel transmit frequency in GHz.
- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison

Step b) 2) 1500MHz to 6GHz

Power threshold = {[Power allowed at numeric threshold for 50 mm {Formula Step A})] + [(test separation distance – 50 mm)·10]} mW

- Power and distance are rounded to the nearest mW and mm before calculation.
- The result is rounded to one decimal place for comparison

Approved by .....

Jon Kenny
Authorised Signatory

Date 09 April 2020

SAR Exclusion Result:

Frequency (MHz)	Power Output mW	Duty Cycle %	Maximum Power (Tune up Value) * (mW)	Test Separation Distance (mm)	SAR Exclusion Power Threshold (mW)	SAR Test Exclusion (Yes/No)
2402	1	98	0.98	200	1595.3	Yes
2480	1	98	0.98	200	1595.3	Yes

* Maximum power including tolerance of the time averaged declared conducted output power of the device.

The SAR exclusion threshold has been evaluated using the formula described above from information supplied by the manufacturer below. Based on the calculation above, the EUT is categorically excluded from SAR testing in stand alone operation. However SAR evaluation may be required for the end product incorporating the module, where simultaneous transmission and co located antennas are used

Manufacturer's Declaration of Product information:

Equipment Description

Technical Description: *(Please provide a brief description of the intended use of the equipment)*	Unshielded wireless radio SiP (System-in-Package) module implementing the Bluetooth Low Energy (BLE) technology according to the 5.2 specification. The BLE stack implements the 1 and 2 Msym/s PHYs, but not the Coded PHYs, and has no direction-finding capabilities. The module comes with an RF pin meant to route the RF signal to either an external antenna or to an adjacent pin for making use of the integral antenna
Manufacturer:	Silicon Laboratories Finland Oy
Model:	BGM220S12A
Part Number:	

If more than one frequency band is supported, please confirm which combinations of bands are capable of Simultaneous Transmit.	

Frequency Band 1: Please detail (one entry for each band), e.g GSM 900 / WCDMA FDD I etc .

Antenna Model:	Integral, discrete / Reference external dipole	
Antenna length:	- / 14.2	cm
Bottom frequency:	2402	MHz
Middle frequency:	2440	MHz
Top frequency:	2480	MHz

Maximum power (input to the antenna including a tolerance):	-0.5	dBm
Antenna gain (or maximum gain allowed):	Integral: +1.5 External: +3.2	dBi

Or

Field Strength Measurement:		dBµA/M
Measurement Distance:		cm

Separation distance from antenna to the user/bystander	20 for Mobile case. To be determined for Portable case.	cm
Transmitter Duty Cycle:	98 or 4.88 depending on the mode of operation, connection or advertisements	%

Frequency Band 2: Please detail (one entry for each band), e.g GSM 900 / WCDMA FDD I etc

Antenna Model:	Integral, discrete / Reference external dipole	
Antenna length:	- / 14.2	cm
Bottom frequency:	2401	MHz
Middle frequency:	Only two channels in this optional use case	MHz
Top frequency:	2481	MHz

Maximum power (input to the antenna including a tolerance):	-0.5	dBm
Antenna gain (or maximum gain allowed):	Integral: +1.5 External: +3.2	dBi

Or

Field Strength Measurement:		dBµA/M
Measurement Distance:		cm

Separation distance from antenna to the user/bystander	20 for Mobile case. To be determined for Portable case.	cm
Transmitter Duty Cycle:	3.6	%

I hereby declare that the information supplied is correct and complete.

Name: Tom Nordman

Position held: Marketing Director of IoT Wireless Products at Silicon Laboratories Finland Oy,
Alberga Business Park, Bertel Jungin aukio 3, FI-02600 Espoo, Finland
(Phone: +358 9 435 5060, www.silabs.com)

Date: 18 March 2020