

RF Exposure Evaluation

Product:	Bluetooth module
Model no.:	GCC-BTM002S
FCC ID:	2A979GCC-BTM002S
Rating:	3.3VDC
RF Transmission Frequency:	2402MHz-2480MHz
Modulation:	GFSK
Antenna Type:	PCB Antenna
Max Antenna Gain:	1.87 dBi
Description of the EUT:	The Equipment Under Test is Bluetooth module with BLE function (Bluetooth edition: 5.0, bite rate: 1Mbit/s). The BLE TX and RX frequency is 2402MHz-2480MHz.
Reference Report	68.930.22.0049.01A

1. Limit and Guidelines on Exposure to Electromagnetic Fields

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance v06, Mobile Portable RF Exposure, no SAR required if power is lower than the flowing threshold:

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})]$

$[\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f(\text{GHz})$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation²⁵
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

2. Calculation method

$[(\text{max. power of` channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$

For GFSK Modulation 2440MHz

Radiated Power + tune up tolerance = 4.74 mW

Distance = 5 mm

$f = 2.44$ GHz

$[4.74/5] \cdot \text{SQRT}(2.44) = 1.48$

$1.48 \leq 3.0$

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Therefore, excluded from SAR testing.

TUV SUD China, Shenzhen Branch

Reviewed by:

Prepared By:



John Zhi/ EMC Project Manager

Date: 2023-06-10



Grace Gao/EMC Project Engineer

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