Mobile Technologies Inc.
EMPOWERING THE USE OF MOBILE DEVICES

# Antenna Specification Datasheet

**Manufacturer : Silicon Laboratories Inc**
**Address : 400 West Cesar Chavez, Austin, TX 78701 USA**

**Model No. : BGM220S22A**

According to the BGM220S Wireless Gecko Bluetooth Module Data Sheet

## 3. System Overview

### 3.1 Introduction

The BGM220S module combines an energy-friendly MCU with a highly integrated radio transceiver in a SiP module with a robust, integrated antenna. This section gives a short introduction to the features of the module.

The block diagram for the BGM220S module is shown in the figure below. The wireless module includes the EFR32BG22 wireless System on a Chip (SoC), required decoupling capacitors and inductors, 38.4 MHz crystal, RF matching circuit, and integrated antenna.

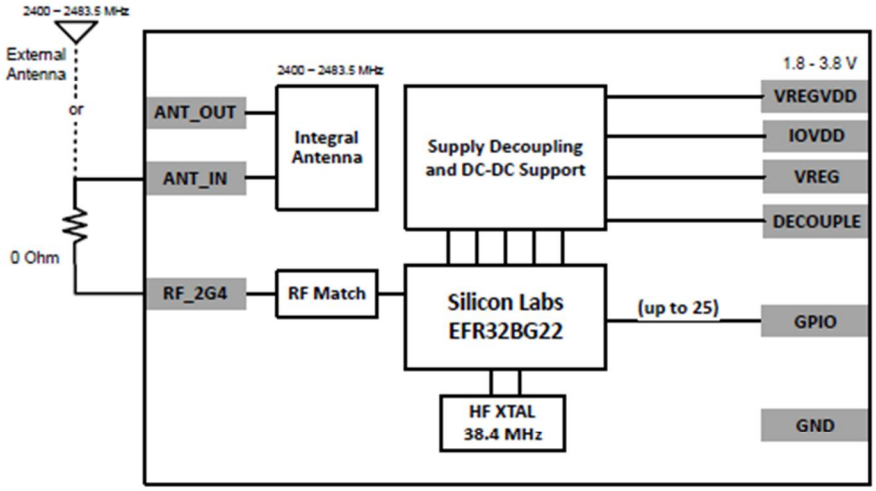


**Figure 3.1. BGM220S Block Diagram**

A simplified internal schematic for the BGM220S module is shown in the figure below.

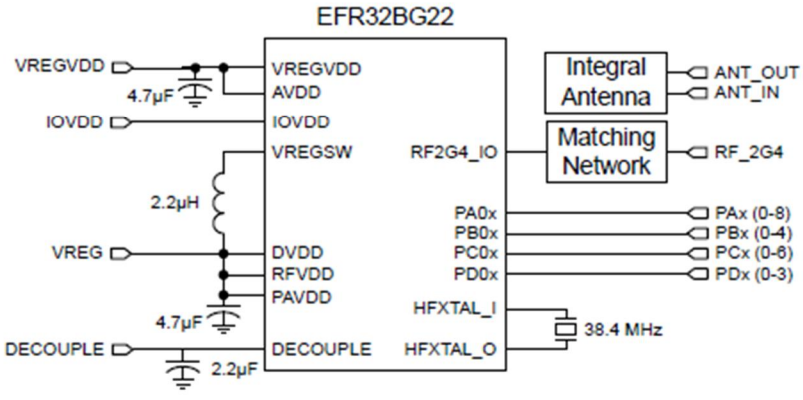


**Figure 3.2. BGM220S Module Schematic**

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### 3.2 EFR32BG22 SoC

The EFR32BG22 SoC features a 32-bit ARM Cortex M33 core, a 2.4 GHz high-performance radio, 512 kB of flash memory, a rich set of MCU peripherals, and various clock management and serial interfacing options. Consult the EFR32xG22 Wireless Gecko Reference Manual and the EFR32BG22 Data Sheet for details.

### 3.3 Antenna

BGM220S modules include an integral antenna on board with the characteristics detailed in the tables below.

**Table 3.1. Antenna Efficiency and Peak Gain (BGM220S12A)**

| Parameter | With optimal layout | Note |
|---|---|---|
| Efficiency | -1.4 to -2.6 dB | Antenna efficiency, gain and radiation pattern are highly dependent on the application PCB layout and mechanical design. Refer to 7. Design Guidelines for recommendations to achieve optimal antenna performance. |
| Peak gain | 1.5 dBi | |

**Table 3.2. Antenna Efficiency and Peak Gain (BGM220S22A)**

| Parameter | With optimal layout | Note |
|---|---|---|
| Efficiency | -1 to -2 dB | Antenna efficiency, gain and radiation pattern are highly dependent on the application PCB layout and mechanical design. Refer to 7. Design Guidelines for recommendations to achieve optimal antenna performance. |
| Peak gain | 2.3 dBi | |

### 3.4 Power Supply

The BGM220S requires a single nominal supply level of 3.0 V to operate. All necessary decoupling and filtering components are included in the module, and the supply is fully regulated internally.

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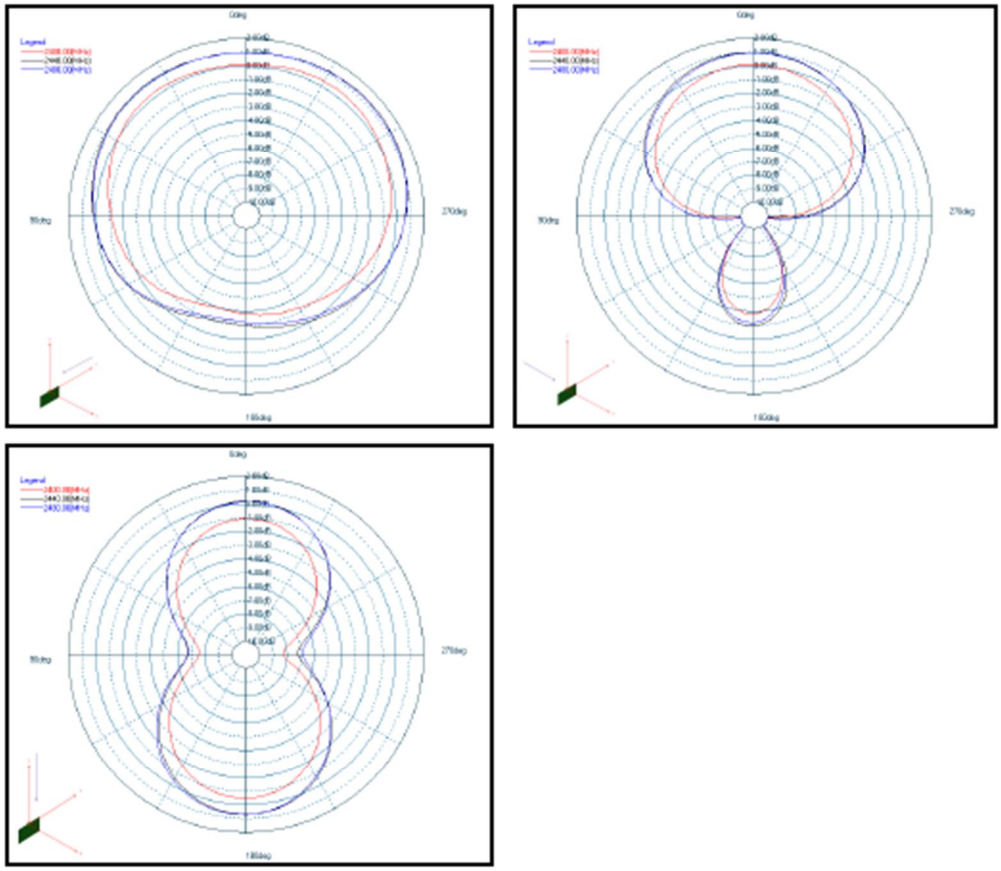
### 4.16.1 Antenna Typical Characteristics

Typical BGM220S radiation patterns for the on-board chip antenna under optimal operating conditions are plotted in the figures that follow. Antenna gain and radiation patterns have a strong dependence on the size and shape of the application PCB the module is mounted on, as well as on the proximity of any mechanical design to the antenna.



Top Left: Phi 0°, Top Right: Phi 90°, Bottom Left: Theta 90°

**Figure 4.3. BGM220S12A Typical 2D Antenna Radiation Patterns on 50 mm x 30 mm board**