



Suga Electronics Limited

## **Model: SWBGFSA-0**

### **Circuit Description**

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#### **INTRODUCTION**

SWBGFSA-0 is a 3-in-1 wireless communication module which includes

- WLAN (802.11b/g/n) at 2.4GHz.
- Bluetooth (V2.1+EDR, V3.0+HS, V4.0 low energy) at 2.4GHz.
- GPS at 1.575GHz.

#### **MAJOR COMPONENTS**

- U1 is a single chipset to handle all the operations.
- U3 is an oscillator (TCXO) 26MHz. It supplies clock to U1 for major operations.
- Y1 is a crystal 32.768kHz. It supplies clock to U1 for real time clock operation.
- ANT5 is an on-board passive chip antenna at center frequency 2.4GHz. It is for reception and transmission of Wifi and Bluetooth signal from and to U1.
- CON1 is a RF connector. An external GPS antenna at 1.575GHz is connected to CON1 via coaxial cable.
- F1 is a passive band pass filter at 2.4GHz for Wifi and Bluetooth signal conditioning.
- U10 is a SAW filter at 1.575GHz for GPS signal conditioning.
- U6 is a low noise amplifier (LNA) for GPS signal conditioning.
- There are 23 connection pins to connect to the external host system for power supply, operation control and data transfer.



## **OPERATION**

### **General Operation**

The 3-in-1 wireless module SWBGFSA-0 is connected to an external host system via the 23 connection pins. It obtains 3.3V DC power supply from host system for operation. Its operation is controlled and monitored by the external host system via control and data interface (SDIO, UART, PCM). U1 is the main chipset that receives control from and exchanges data to/from the external host system.

### **Wifi/Bluetooth Operation**

U1 establishes Wifi or BT connectivity to external wireless device via the on-board Wifi+BT chip antenna ANT5 and the conditioning circuits between ANT5 and U1. Upon reception of data from external host system, U1 modules and transmits data to ANT5. Upon reception of signal from ANT5, U1 demodulates and transmits data to the external host system.

### **GPS Operation**

The on-board RF connector CON1 is connected to an external GPS antenna via coaxial cable. The antenna receives GPS signal from satellites in the sky. The GPS signal is conditioned by the SAW filter and low noise amplifier and is finally transferred to U1. U1 demodulates, decodes and transmits GPS raw data to the external host system.