Manual for BT module

Samsung

Version Number

Version No.	*Date*	*Comments*
1.0	*2010.10.12*	*First issued*

Revision History

Revision No.	*Date*	*Comments*

1. Introduction

This module is USB I/F connector embedded module compliant with Bluetooth 2.1 , MAC/baseband/radio optimized for low-power applications. The core chipset is from Brodcom, part number BCM2046B1.
This application is designed for 3D TV and wireless communication with 3D-Glasses.

2. Hardware Architecture:

2.1 Main Chipset Information

Item	Vendor	Part Number
Bluetooth 2.1 mac/baseband/radio	Brodcom	BCM2046

2.2 Circuit Block Diagram

The major internal and external block diagram of Samsung remo-con module is illustrated in Figure 1-1.

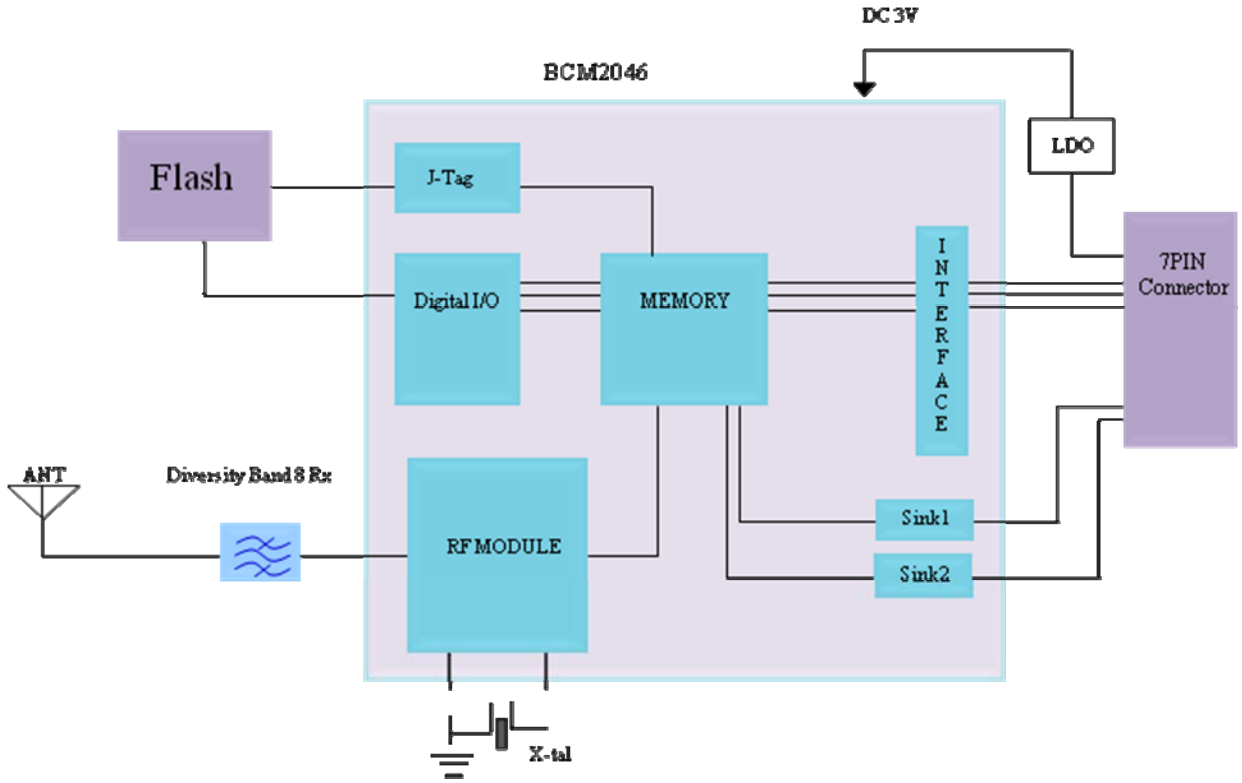


Figure 1-1 Samsung BT module block diagram and System Interface

2.3 Module output power information

- Module output power within filter

Class type	TX power(typ.)	Data rate
Cass2	0dBm	1Mbps

3. Operational Description

Samsung BT module is the Bluetooth RF Module that acts as a communication controller for users of a wireless device to connect to 3D_ TV. This uses Bluetooth standard IEEE 802.15.1/1a with 79 channels (2402MHz~2480MHz, Space 1MHz)

- Time base of the RF frequency

For Zero IF and RF frequency, a crystal(26MHz) is a clock reference.

- Synthesizer

Synthesizer inside Transceiver. Internal voltage controlled oscillator (VCO) provides the desired LO signal base on the phase-locked loop (PLL) with a relatively wide tuning range for this application.

- Transmission

Base-band Processing (BBP) IC has FHSS(frequency Hopping Spread Spectrum) and (2FSK/DQPSK/8DPSK) modulation function, it provides transmission data rate are 1, 2(EDR), 3(EDR) Mbps, now this module is adopted 2FSK and data rate 1MHz, Digital data signal will be converted to analog (TX IQ) signals through DAC in BBP IC, TX IQ pass through to low pass filter. TX I/Q signal use direct conversion (zero-IF) architecture converter to generate carrier frequency signal. Transceiver IC and internal PA magnify output power.

- Receiver

Reverse direction isolation of LNA inside Transceiver IC suppresses unwanted radiation. Then RF signal will be directly down to IF signal (RX IQ) and high frequency spurious emissions are suppressed by LPF. At last RX IQ signal will be demodulated digital data.

- Base band Processing

Channel selection is controlled by BBP IC to support data modulation:

0.5BT Gaussian-filtered 2FSK : 1Mbps

0.4 BT pi/4 DQPSK : 2Mbps available
0.4 BT 8DPSK : 3Mbps available

- Power Control Level

The interated PA for this device can transmit at a maximum power of +4dBm for class 2 operation.

- Transmit/Receive Switch

DUT has Transmit/Receive Switch. End user can't select any power setting.

4. Application for 3D_TV

This module is 7pin connector for connection with 3D_TV, The main interface is USB(3,4pin ,USB D+,D-) and

6,7pins are used as 3D Sink signal input/output.

IF the signal of 3D_TV comes from 3D_TV's main CPU, the signal is modulated at the baseband of RF transceiver and transmitted to 3D_Glass, via RF Block.

5. Pin description

1.Reset : it is used to hardware reset

2. Vcc : it is used to 5V power supply input.

3. USB D- : USB nagative interface.

4. USB D+ : USB positive interface.

5. GROUND

6. 3D_SYNC_IN : sink signal input from 3D_TV

7. 3D_SYNC_OUT : sink signal output to 3D_TV

6. Installation

This radio module must be installed in a device and not allow the user to replace nor modify it.

And the location of installation is as follows Figure 6-1.

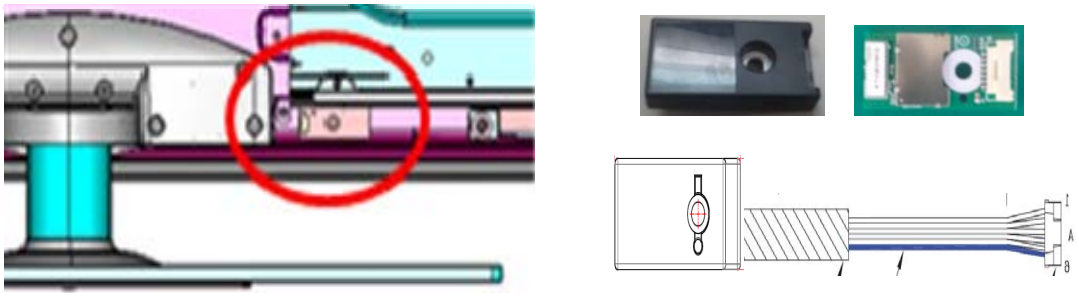
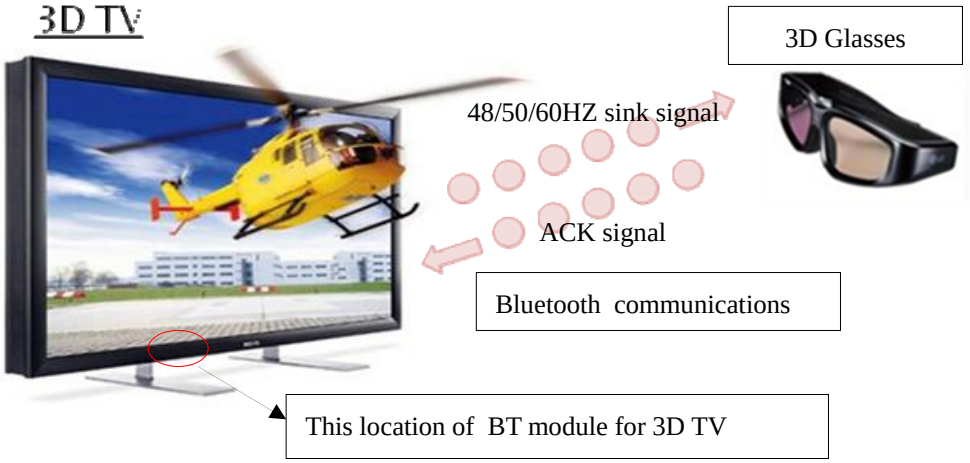


Figure 6-1 The location of installation

7. Brief

This radios system block diagram is as follows figure 7-1



7. Notice

FCC ID: A3LWIBT20

NOTICE
In accordance with FCC Part 15, the A3LWIBT20 is listed as a Modular Transmitter device. End products that include the A3LDNUBS1 shall have the words “Contains Transmitter module FCC ID: A3LWIBT20 ” on an exterior label
l.
This device complies with Part 15 of FCC Rules. Operation is Subject to following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received including interference that cause undesired operation.
This equipment has been tested and found to comply within the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a different circuit from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

The transmitter must not be co-located or operated in conjunction wit any other antenna or transmitter.
The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure to low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by additional research.
To satisfy RF exposure requirements, this device and its antenna(s) must operate with a separation distance of at least 20 centimeters from all persons and must not be co-located or operated in conjunction with any other antenna or transmitter. End-users must be provided with specific operating instructions for satisfying RF exposure.

FCC WARNING:

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

Information for Canadian Users (IC Notice)

IC : 649E-WIBT20

The term “IC” before the radio certification number only signifies that Industry Canada technical specifications were met. Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.
This Class B digital apparatus complies with Canadian ICES-003.

The available scientific evidence does not show that any health problems are associated with using low power wireless devices. There is no proof, however, that these low power wireless devices are absolutely safe. Low power wireless devices emit low levels of radio frequency energy (RF) in the microwave range while being used. Whereas high levels of RF can produce health effects (by heating tissue), exposure to low-level RF that does not produce heating effects causes no known adverse health effects. Many studies of low-level RF exposures have not found any biological effects. Some studies have suggested that some biological effects might occur, but such findings have not been confirmed by addition