FCC ID: QLHCAF0303

Operational Description

1. Bluetooth Module

1.1 RF Receiver

The receiver features a near-zero Intermediate Frequency (IF) architecture that allows the channel filters to be integrated on to the die. Sufficient out-of –band blocking specification at the Low Noise Amplifier (LNA) input allows their radio to be used in close proximity to Global System for Mobile Communications (GSM) and Wideband Code Division Multiple Access (W-CDMA) cellular phone transmitters without being desensitized. The use of a digital Frequency Shift Keying (FSK) discriminator means that no discriminator tank is needed and its excellent performance in the presence of noise allows BlueCore2-External to exceed the Bluetooth requirements for co-channel and adjacent channel rejection.

1.1.1 Low Noise Amplifier

The LNA can be configured to operate in single-External to exceed the Bluetooth requirements for co-channel and adjacent channel rejection.

1.1.2 Analogue to Digital Converter

The Analogue to Digital Converter (ADC) is used to implement fast Automatic Gain Control (AGC). The ADC samples the Received Signal Strength Indicator (RSSI) voltage on a slot-by-slot basis. The front-end LNA gain is changed according to the measured RSSI value, keeping the first mixer input signal within a limited range. This improves the dynamic range of the receiver, improving performance in interference-limited environments.

1.2 RF Transmitter

1.2.1 IQ Modulator

The transmitter features a direct IQ modulator to minimize the frequency drift during a transmit timeslot which results in a controlled modulation index. A digital base band transmit filter provides the required spectral shaping.

1.2.2 Power Amplifier

The internal Power Amplifier (PA) has a maximum output power of +6dBm allowing BlueCore2-External to be used in Class 2 and Class 3 radios without an external RF PA. Support for transmit power control allows a simple implementation for Class 1 with an external RF PA.

1.3 RF synthesizer

The radio synthesizer is fully integrated onto the die with no requirement for an external Voltage Controlled Oscillator (VCO) screening can, varactor tuning diodes or LC resonators.

1.4 Base band and Logic

1.4.1 Memory Management Unit

The Memory Management Unit (MMU) provides a number of dynamically allocated ring buffers that hold the data, which is in transit between the host and the air or vice versa. The dynamic allocation of memory ensures efficient use of the available Random Access Memory (RAM) and is performed by hardware MMU to minimize the overheads on the processor during data/voice transfers.

1.4.2 Burst Mode Controller

During radio transmission the Burst Mode Controller (BMC) constructs a packet form header information previously loaded into memory-mapped registers by the software and payload data/voice taken from the appropriate ring buffer in the RAM. During radio reception, the BMC stores the packet header in memory-mapped registers and the payload data in the appropriate ring buffer in RAM. This architecture minimizes the intervention required by the processor during transmission and reception.

1.4.3 Physical Layer Hardware Engine DSP

Dedicated logic is used to perform the following:

- Forward error correction
- Header error control
- Cyclic redundancy check
- Encryption
- Data whitening
- Access code correlation
- Audio transcoding

The following voice data translations and operations are performed by firmware:

- A-law/ μ -law/linear voice date(from host)
- A-law/ μ -law/Continuously Variable Slope Delta(CVSD)(over the air)
- Voice interpolation for lost packets
- Rate mismatches

1.4.4 RAM

32Kbytes of on-chip RAM is provided and is shared between the ring buffers used to hold voice/data for each active connection and the general purpose memory required by the Bluetooth stack.

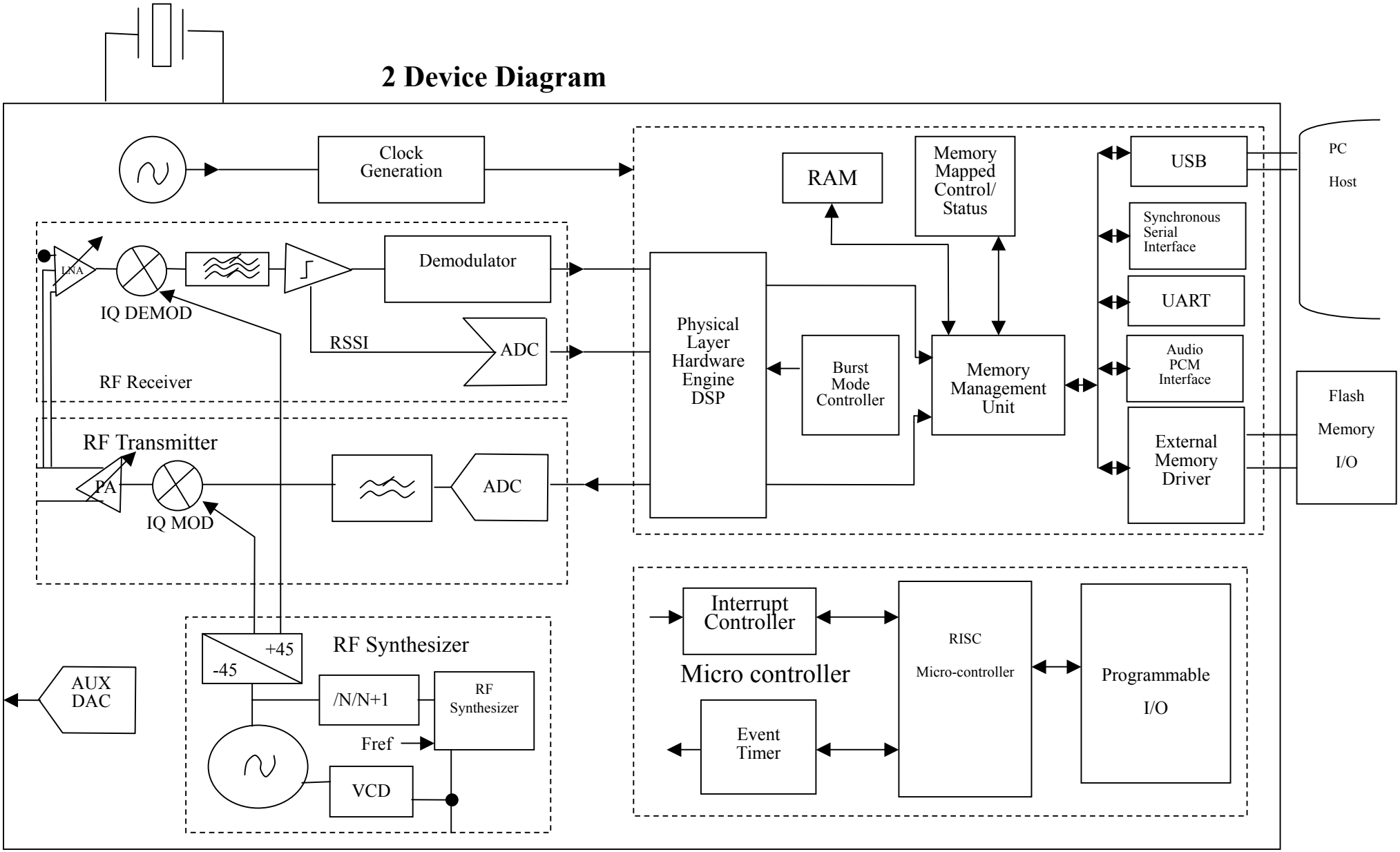
1.4.5 External Memory Driver

The External Memory Driver interface can be used to connect to the external Flash memory and also to the optional external RAM for memory intensive applications.

1.4.6 USB

This is a full speed Universal Serial Bus interface for communicating with other compatible digital devices. BlueCore2-External acts as a USB peripheral, responding to requests form a Master host controller such as a PC.

2 Device Diagram



3 Device Terminal Descriptions

3.1 RF Parts

The BlueCore2-External RF_IN terminal can be configured as either a single-ended or differential input. The operational mode is determined by setting the Persistent Store Key PSKEY_TXRX_PIO_CONTROL (0x209). Using a single-ended RF input to be used for Class 2 operation, as shown in figure3.1.

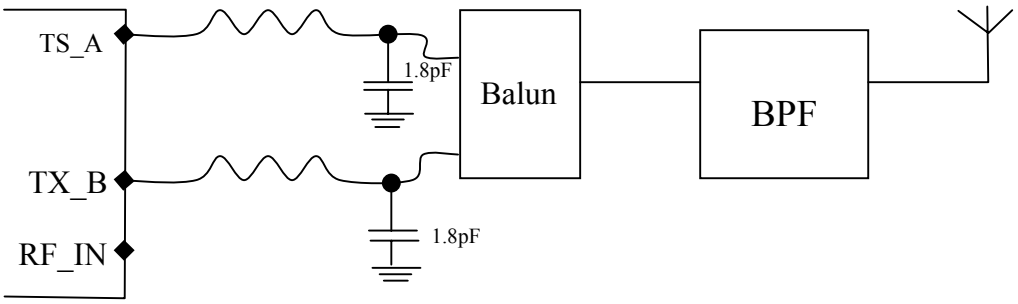


Figure 3.1: RF Parts (Class2)

2. Power Converter

The Power Converter use TI TPS61016 DC/DC converter. Transfer voltage level form battery (AAA x 2) to stable DC 3.3V, supply BT-PM01B.

3. Keypad

The keypad control of BT-PM01B functions, including Scroll-down, Scroll-up, function key and control of the cursor.

4. Laser Module

The Laser Module support laser pointer function.