

# Operational Description

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EUT is a **Mobile printer (Model: MP-300BT)** with 79 channels (2402~2480MHz, Space 1MHz). It allows you to connect to other Bluetooth device.

## **1. General Operational Description:**

Time base of the transmission frequency:

For IF and RF frequency, Crystal is a clock reference.

## **2. The analogue to digital converter**

The analogue to digital converter(ADC) is used to implement fast automatic Gain Control (AGC). The ADC sample the Received Signal Strength indicator (RSS)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 environment

## **3. RF Transmitter:**

Bluetooth IC has FHSS (GFSK) modulation function, it provides transmission data rate are 1 Mbps. Digital data signal will be converted to analog (TX IQ) signals through DAC in Bluetooth IC, TX IQ pass through to low pass filter of Bluetooth IC. TX I/Q signal use direct conversion (zero-IF) architecture converter to generate carrier frequency signal. Bluetooth IC has a power amplifier to magnify output power.

### **3.1 Synthesizer:**

The radio Synthesiser is fully integrated onto the die with no requirement for an external voltage Controlled Oscillator (VCO) screening can, varactor tuning diodes, LC resonators or loop filter. The Synthesiser is guaranteed to lock in sufficient time across the guaranteed temperature range to meet the Bluetooth v2.0+EDR specification.

### **3.2 Clock input and Generation:**

The reference clock for the system is generated from a TCXO or crystal input between 8MHz and40MHz.All internal reference clocks and generated using a phase locked loop, which is locked to external reference frequency.

### **3.3 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. Digital baseband transmit circuitry provides the required spectral shaping.

### **3.4 Power Amplifier**

The internal Power Amplifier (PA) has a maximum output power of +5dbm.This allows Bluecore4-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.

## **4. Base band and Logic:**

### **4.1 Management Unit**

The memory management Unit(MMU) provides a number of dynamically allocated ring buffer that hold

the data that is in transit between the host and the air. The dynamic allocation of memory ensures efficient use of the available Random Access Memory (RAM) and is performed by a hardware MMU to minimise the overheads on the processor during data/voice transfer.

#### **4.2 Burst Mode Controller**

During radio transmission the burst Mode Controller (BMC) constructs a packet from 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 minimises the intervention required by the processor during transmission and reception.

#### **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

Auto transcoding

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

A-law/u-law/linear voice data (from host)

A-law/u-law/continuously Variable Slope Delta (CVSD)(over the air)

Voice interpolation for lost packets

Rate mismatches

The hardware support all optional and mandatory features of Bluetooth v2.0+EDR including AFH and eSCO

#### **4.4 Synchronous Serial interface:**

This is a Synchronous Serial port interface (SPI) for interfacing with other digital devices. The SPI port can be used for system debugging. It can also be used for programming the flash memory.

#### **4.5 Microcontroller**

The Microcontroller (MCU), interrupt controller and event timer run the Bluetooth software stack and control the radio and host interface. A 16-bit reduced instruction set computer (RISC) microcontroller is used for low power consumption and efficient use of memory.

#### **4.6 External Memory Driver**

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

#### **4.7 RAM (48Kbytes)**

48Kbytes of on-chip RAM is provided to support the RISC MCU 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.

#### **4.8 Programmable I/O**

BlueCore4-External has a total of 15 (12 digital and 3 analogue) programmable I/O terminals. These are

controlled by firmware running on the device.

#### 4.7 802.11 Co-Existence Interface

Dedicated hardware is provided to implement a variety of Co-existence schemes. Channel skipping AFH, priority signalling, channel signalling and host passing of channel instructions are all supported. The features are configured in firmware. The details of some methods are proprietary (e.g. Intel WCS)

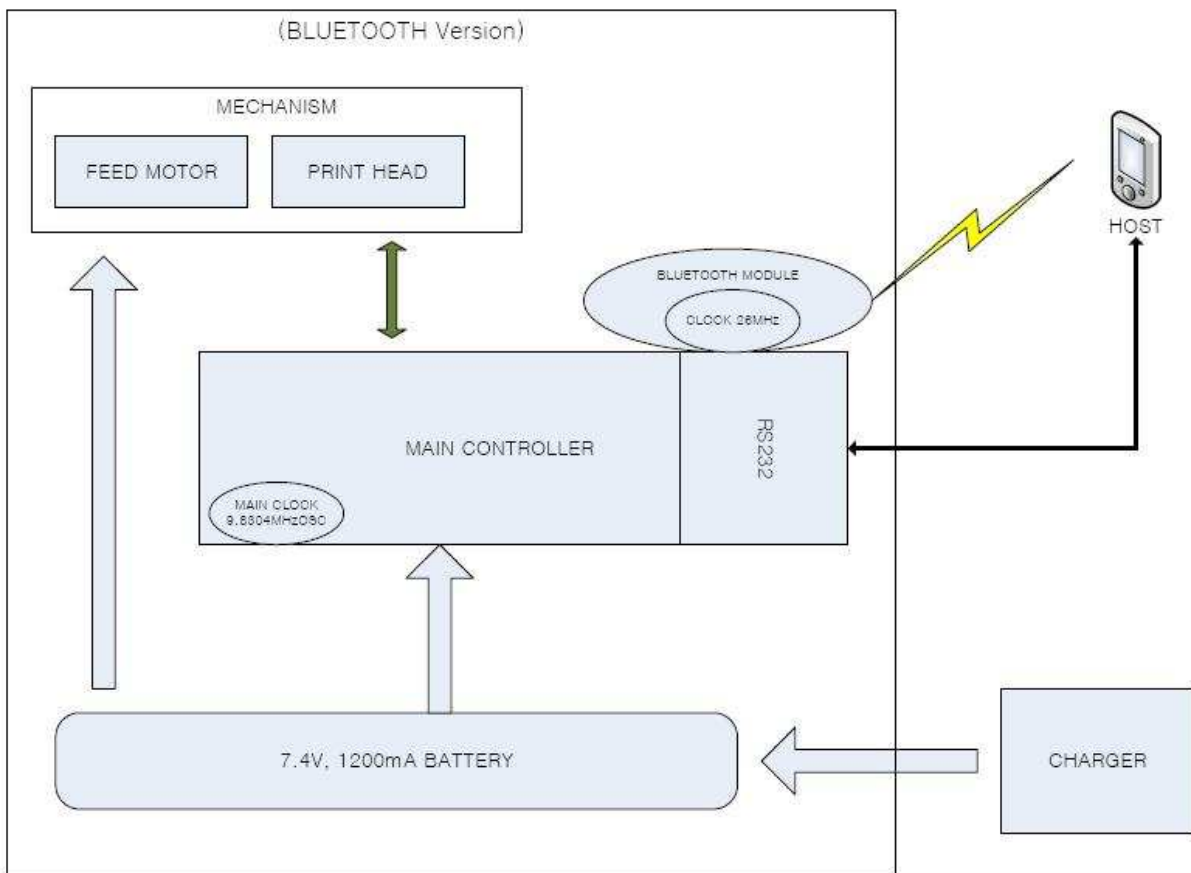
#### 4.8 USB

USB / This is full speed Universal Series Bus (USB) interface for communicating with other compatible digital device. BluetCore4-External acts as a USB peripheral, responding to requests from a master host controller such as a PC.

#### 5. Power:

Input 8.4Vdc from PC through DC Jack port / Battery. This power is provided to regulator components to regulated DC power.

#### 6. Printer Operation configuration



## 7. Bluetooth module operation configuration

