

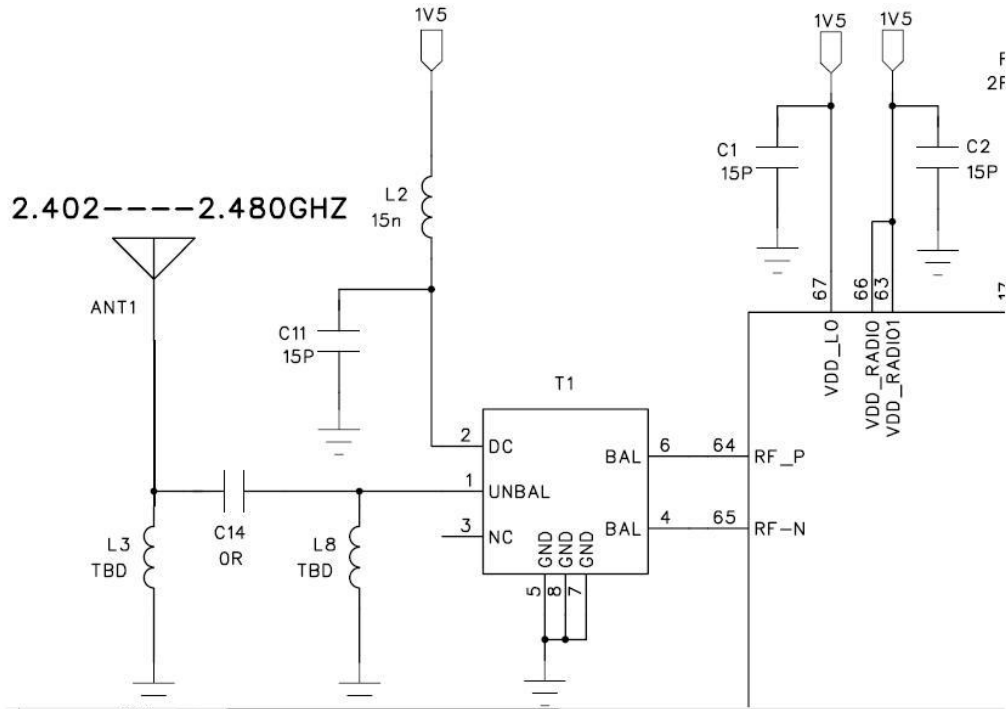
Trex Pro Circuit Description

Bluecore5-Multimedia ROM QFN(BC57F687A04) U1

The BlueCore5 device, U1, selected for this design is a Bluecore5-Multimedia ROM QFN. This represents the lowest component cost option compared with any other variant of BlueCore5- Multimedia QFN with a EPPROM.

RF Front-End

Figure 1 shows the proportion of the schematic associated with the RF front-end



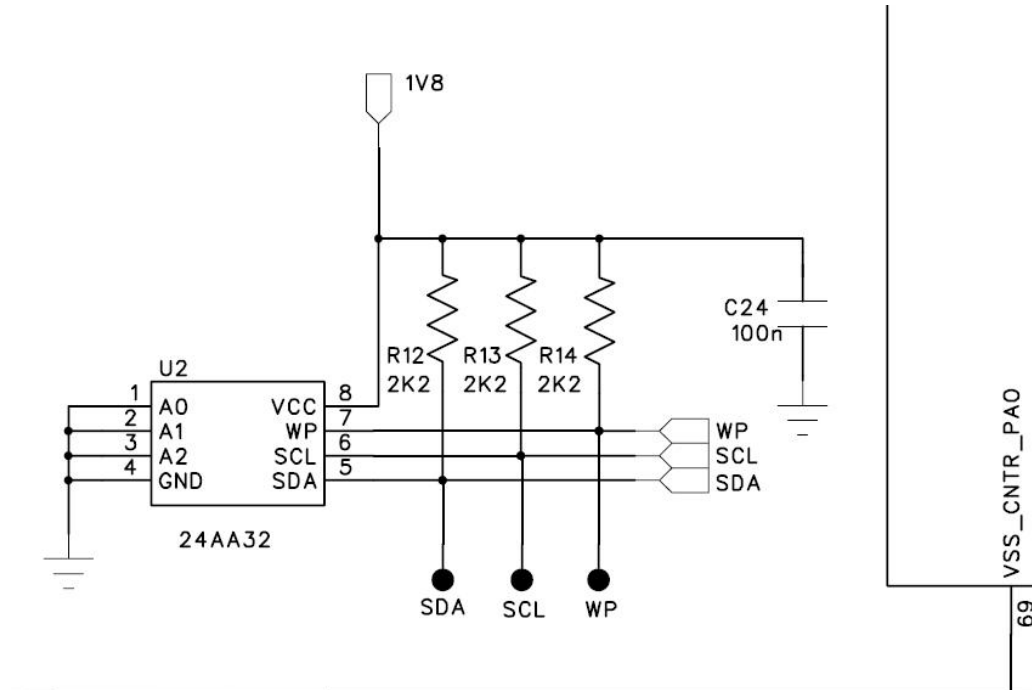
(1)

It consists of:

- A balanced antenna filter, T1, a Soshin DBF81F104-CSR-T. The main benefits of this component is its small form factor and low cost when compared to a separate filter/balun solution.
- An LC network, L2 and C11. This provides a DC bias for the BlueCore5-Multimedia ROM QFN from the 1.5V rail.
- corresponding DC blocking capacitors C14 and match a network L3, L8.
- A printed meander line antenna The ANT connected the DBF81F104 UNB PIN through a C14.
- T1 is connected directly to the RF pins, 64 and 65 of the BlueCore5-Multimedia ROM QFN.

I2C Interface and EEPROM

The EEPROM mainly saves some Man Machine Interface I informations
The EEPROM schematic part is shown in Figure 2



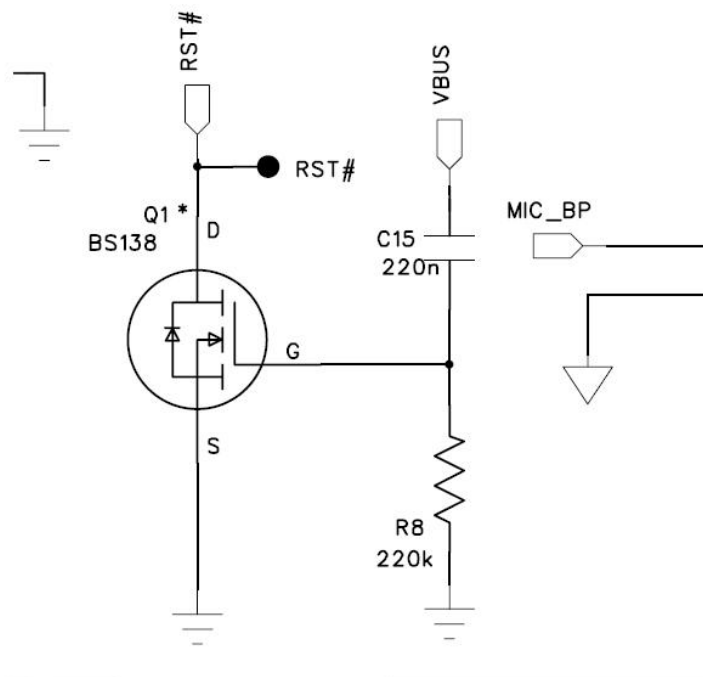
(2)

SCL and SDA of the EEPROM I2C interface are connected to PIO[6] and PIO[7] of the BlueCore5- Multimedia ROM QFN. This, however, is optional with a serial EEPROM.

The recommended EEPROM is 24AA32 from Microchip. It is 32Kbit and can operate with a supply voltage as low as 1.7V.

Reset

Figure 3 shows the crystal and reset section of the main schematic



(3)

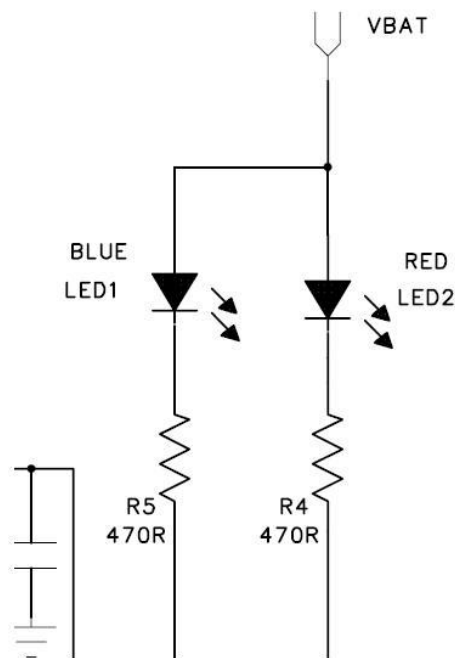
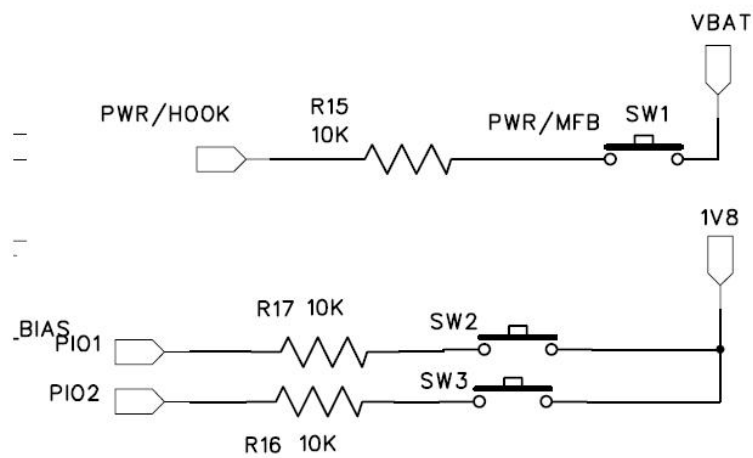
the BlueCore5- Multimedia ROM QFN device reset briefly each time the USB port is plugged in to its supply. This is achieved using C15, R8 and Q1.

The electronic reset can be described as follows:

- Assuming 5V is present on the connector, when the USB plug is inserted, the 0V to 5V transition is transmitted through C15 as a pulse.
- This enables Q1 and BlueCore5- Multimedia ROM QFN is reset.
- The energy in C15 is then slowly discharged through R8 to ground causing the voltage on the gate of Q1 to fall.
- The reset is de-asserted when the voltage on the gate falls below the threshold voltage of Q1 causing the voltage on the RST# pin on BlueCore5- Multimedia ROM QFN to go high (due to the internal pull up resistor on this pin).

Man-Machine Interface (MMI)

Figure (4) shows the proportion of the schematic associated with the MMI.



(4)

Figure (4): MMI: Buttons and LEDs.

It primarily consists of:

- Three surface mount technology (SMT) buttons: SW1-SW3.
- Two LEDs: RED (red), BLUE (blue).

The connection and operation of the ON/OFF button, SW1, was described previously in section Figure (4) of this document.

Buttons SW2, SW3 are connected between the 1.8V rail and various PIO lines on BlueCore5- Multimedia ROM QFN via a series resistor.

RED and BLUE are driven directly from the dedicated LED pins, LED0 and LED1, on BlueCore5- Multimedia ROM QFN. Since BlueCore6-Audio ROM QFN has two dedicated LED drivers only.

On-Off Circuit

The relevant section of the schematic associated with the on-off function is shown in Figure (4).

The circuit consists of the MFB switch, SW1, connected via a series resistor, R15, to pin VREGENABLE_H, of BlueCore5- Multimedia ROM QFN. When SW1 is closed, VREGENABLE_H is pulled high. This enables the switch-mode converter and 3.7V is applied to VREGENABLE_H. Consequently, the core linear regulator and the audio linear regulator are both enabled. Once operational, the regulators within BlueCore5- Multimedia ROM QFN are kept on internal circuitry. The switch can be used as a normal switch since the state of the VREGENABLE_H pin is monitored internally and made available to the firmware.

Audio Front End

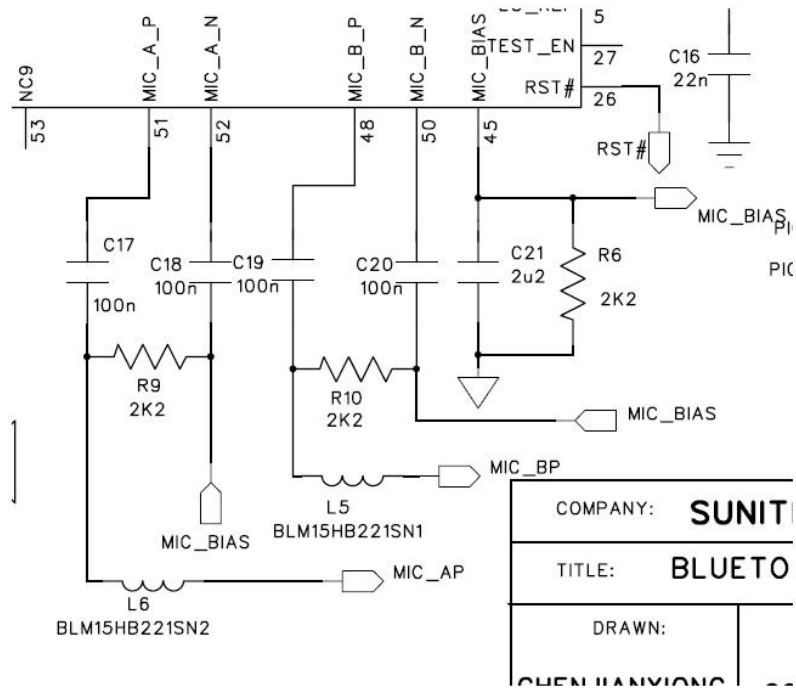
BlueCore5- Multimedia ROM QFN contains a CODEC. The CODEC includes both “audio in” and “audio out”. An output to DC bias an electret type microphone is also available.

Microphone Bias

The programmable bias for the microphone is provided from a low noise voltage regulator. This is internal to the BlueCore5- Multimedia ROM QFN and is located on pin MIC_BIAS. Decoupling is realised using the a 2.2 μ F capacitor, C21. In this particular design.

Audio Inputs

Figure (5) shows the portion of the schematic that represents the audio input section.

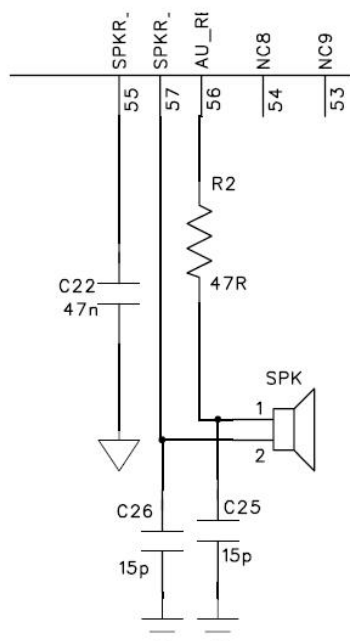


(5)

The audio input terminals of BlueCore5- Multimedia ROM QFN are AC-coupled through four 0.1uF capacitors: C17, C18, C19, C20 .

Audio Outputs

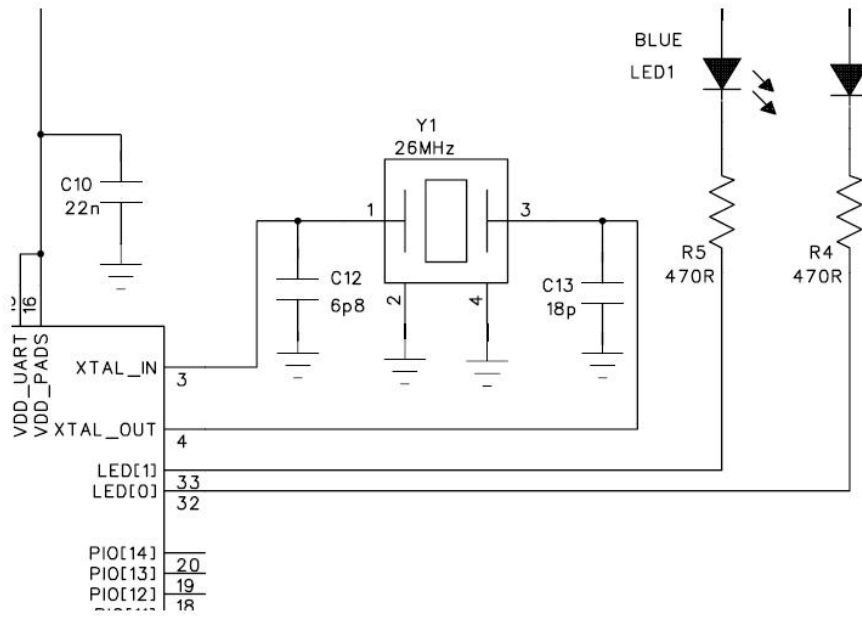
Figure (6) shows the portion of the schematic that represents the audio output section.



(6)

Crystal oscillator

Figure (7) shows the portion of the schematic that represents crystal oscillator section.



(7)