



LM Technologies Ltd.

LM540 Hardware Description

Revision	Date	Name	Description
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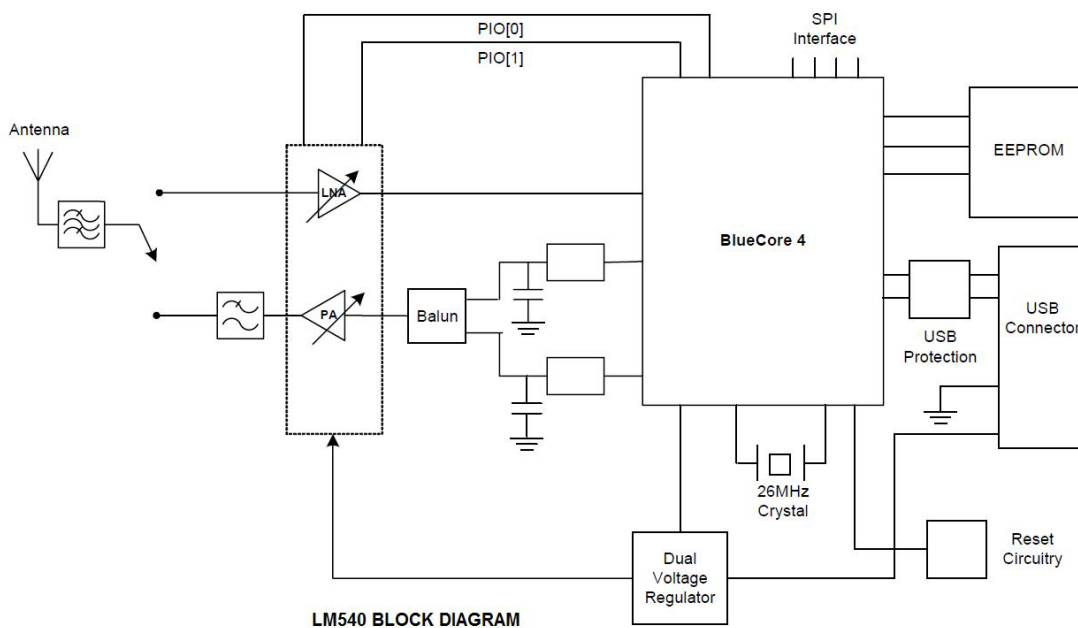
1 Introduction

LM540 is Bluetooth USB adapter which provides bluetooth connectivity between PC and mobile phones or printers or standard bluetooth devices. Bluetooth Drivers (Microsoft, IVT, Toshiba) are installed on computer to allow application software's to access the LM540 bluetooth radio.

LM540 module hardware design is based on Bluecore4 ROM chipset from CSR and uses fixed gain power amplifier to support class1 radio operation. LM540 uses external SMA antenna for radio transmission. SMA antenna is plugged onto the hardware board using RP-SMA connector soldered on the PCB. USB interface allows data communication between LM540 hardware and application software running on computer.

2 Circuit Description

2.1 Block Diagram



2.1.1 RF Transmitter

The transmitter design consists of Bluecore4 ROM connected to Sige SE2425U power amplifier through matching circuit and Balun. Harmonic filtering, transmit/receive switch (UPG2214TK), band pass filter (FI212B245021-T) and edge mount RP SMA antenna connector are included to complete the radio transmission path.

2.1.2 RF Receiver

The receiver design uses the same SMA antenna connector, band pass filter and transmitter/receiver switch. To improve the sensitivity, BPF640 transistor and single ended receiver port of Bluecore4 ROM are used.

2.1.3 26MHz Crystal

26 MHz crystal with tight tolerance (less than 10ppm) feeds clock to crystal driver circuit located inside Bluecore4 Rom chipset. The Bluecore4 ROM chipset enables frequency trimming by adjusting the chipset internal variable capacitors or by adjusting load capacitance of crystal to match the resonant frequency (i.e. 26 Mhz).

2.1.4 Bluecore4 ROM Chipset

Bluecore4 ROM chipset is single chip radio and baseband IC for Bluetooth 2.4GHz systems including enhanced data rates (EDR) to 3Mbps. With an on-chip CSR bluetooth stack, it provides a fully compliant Bluetooth system to BT 2.1+EDR specifications. The chipset outputs radio signal which is fed to external SMA antenna via transmitter circuit. On reception of radio signal from receiver section, the chipset process the incoming signal and interrupts the software stack running on the chipset.

2.1.5 EEPROM Memory

EEPROM memory (16 KB) stores the settings required by Bluecore4 chipset to configure the radio Tx, radio Rx, USB interface and other relevant settings. On powering up, the Bluecore4 ROM chipset reads the settings from the EEPROM using I2C interface. The settings in the EEPROM can be modified by sending specific commands from computer application to Bluecore4 ROM chipset.

2.1.6 USB Interface

The application(s) running on the computer access the Bluecore4 ROM chipset using USB interface. The chipset contains USB 2.0 complaint USB slave and responds to master host controller such as PC. The hardware derives the power supply from the connected USB Master.

2.1.7 SPI Interface

This is synchronous serial port interface (SPI) used for programming the configuration settings in EEPROM via Bluecore4 ROM chipset. It is also used to switch the device in radio test modes which are required during various radio certifications/testing.

2.1.8 Power Supply

As said, the hardware derives power supply from the connected USB Master. The power (+5V) input is fed to input of voltage regulator to get +3.3V stable output. All the hardware blocks are supplied with 3.3V regulated power supply.

2.1.9 Reset Circuit

The reset circuit is connected to active low RESET input of Bluecore4 chipset. The RESET input will trigger chipset reset operation if it is in active low state for time period more than 5 msec.