

Fujitsu FTLL RF Transceiver Circuit Description

The transceiver is simply consisted of two major blocks, one is the RF radio system, the USB serial interface and the Printed trace Wiggle Antenna.

A. RF radio system

The RF radio system is using Cypress CYWUSB6934 Micro-Controller Unit, The micro-Controller is highly integrated 2.4-GHz Direct Sequence Spread Spectrum (DSSS) Radio System-on-Chip (SoC) IC.

From the Serial Peripheral Interface (SPI) to the antenna, the IC is single-chip 2.4-GHz DSSS Gaussian Frequency Shift Keying (GFSK) baseband modems that connect directly to a USB controller or a standard microcontroller.

The receiver and transmitter are a single-conversion low-Intermediate Frequency (low-IF) architecture with fully integrated IF channel matched filters to achieve high performance in the presence of interference. An integrated Power Amplifier (PA) provides an output power control range of 30 dB in seven steps.

Both the receiver and transmitter integrated Voltage Controlled Oscillator (VCO) and synthesizer have the agility to cover the complete 2.4-GHz GFSK radio transmitter ISM band. The VCO loop filter is also integrated on-chip.

The Micro-Controller is supplied by an external 13 MHz Crystal.

And MCU is supplied by DC voltage, at 5VDC +/- 5% and total currents consumption with full RF operation is no more than 80mA.

B. USB serial interface

The USB serial interface is using Cypress CY7C63743 Micro-Controller Unit, The micro-Controller is the breakthrough design of a crystal-less oscillator.

Other external components commonly found in low-speed USB applications such as pull-up resistors, wake-up circuitry, and a 3.3V regulator are integrated, too.

The CY7C63743 includes an integrated USB serial interface engine (SIE) that supports the integrated peripherals. The hardware supports one USB device address with three endpoints. The SIE allows the USB host to communicate with the function integrated into the microcontroller. A 3.3V regulated output pin provides a pull-up source for the external USB resistor on the D- pin.

C. Printed trace Wiggle Antenna

A Printed trace Wiggle Antenna is consisted of RF output signal, located on the Printed Circuit Board of the transceiver.

The radio module printed circuit board is implemented on a two-layer board. The Wiggle trace antenna and RF grounding are specially designed by Cypress Semiconductor, one side tied to the RF output end and the other side is open to the air.