

Description of Operation

The EUT is a Wireless Keyboard operated in the unlicensed worldwide Industrial, Scientific and Medical (ISM) band (2.400GHz~2.483GHz). And this device provided of transmitting speed:[GFSK: 2Mbps](#) the device of RF carrier is GFSK.

Features of the RF Transceiver include:

- General

Worldwide 2.4 GHz ISM band operation

Common antenna interface in transmit and receive

GFSK modulation

250kbps, 1 and 2Mbps on air data rate

- Transmitter

Programmable output power: 0, -6, -12 or -18dBm

11.1mA at 0dBm output power

- Receiver

Integrated channel filters

13.3mA at 2Mbps

-82dBm sensitivity at 2 Mbps

-85dBm sensitivity at 1 Mbps

-94dBm sensitivity at 250 kbps

- RF Synthesizer

Fully integrated synthesizer

1 MHz frequency programming resolution

Accepts low cost ± 60 ppm 16 MHz crystal

1 MHz non-overlapping channel spacing at 1 Mbps (disabled)

2 MHz non-overlapping channel spacing at 2 Mbps

The state diagram shows the operating modes of the RF Transceiver and how they function. At the end of the reset sequence the RF Transceiver enters Power Down mode. When the RF Transceiver enters Power Down mode the MCU can still control the module through the SPI and the rfcsn bit in the RFCON register.

There are three types of distinct states highlighted in the state diagram:

- Recommended operating mode: is a recommended state used during normal operation.
- Possible operating mode: is a possible operating state, but is not used during normal operation.
- Transition state: is a time limited state used during start up of the oscillator and settling of the PLL.

RX mode

The RX mode is an active mode where the RF Transceiver is used as a receiver. To enter this mode, the RF Transceiver must have the PWR_UP bit, PRIM_RX bit and the rfce bit is set high.

In RX mode the receiver demodulates the signals from the RF channel, constantly presenting the demodulated data to the baseband protocol engine. The baseband protocol engine constantly searches for a valid packet. If a valid packet is found (by a matching address and a valid CRC) the payload of the packet is presented in a vacant slot in the RX FIFOs. If the RX FIFOs are full, the received packet is discarded.

The RF Transceiver remains in RX mode until the MCU configures it to standby-I mode or power down mode. However, if the automatic protocol features in the baseband protocol engine are enabled, the RF Transceiver can enter other modes in order to execute the protocol.

In RX mode a Received Power Detector (RPD) signal is available. The RPD is a signal that

is set high when a RF signal higher than -64 dBm is detected inside the receiving frequency channel. The internal RPD signal is filtered before presented to the RPD register. The RF signal must be present for at least 40µs before the RPD is set high.

TX mode

The TX mode is an active mode for transmitting packets. To enter this mode, the RF Transceiver must have the PWR_UP bit set high, PRIM_RX bit set low, a payload in the TX FIFO and a high pulse on the rfce bit for more than 10 µs.

The RF Transceiver stays in TX mode until it finishes transmitting a packet. If rfce = 0, RF Transceiver returns to standby-I mode. If rfce = 1, the status of the TX FIFO determines the next action. If the TX FIFO is not empty the RF Transceiver remains in TX mode and transmits the next packet. If the TX FIFO is empty the RF Transceiver goes into standby-II mode. The RF Transceiver transmitter PLL operates in open loop when in TX mode.

The device adapts GFSK modulation. And the antenna was [print on PCB](#), and provided diversity function to improve the receiving function. It allows your keyboard to connect to your computer without cable.

And this EUT Operation in 2.4GHz [GFSK](#) radio transmission.

The other instruction, please have a look at the user's manual.