PmodRF2™ Reference Manual

Overview

The PmodRF2 is an interface board for the Microchip® MRF24J40 IEEE 802.15.4™ 2.4GHz RF transceiver module. The PmodRF2 can add RF communication to any Digilent system board.
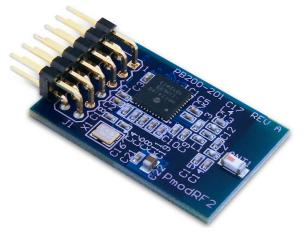
Features include:

- IEEE 802.15-compliant RF transceiver
- supports ZigBee ®, MiWi™, MiWi P2P and proprietary wireless networking protocols
- ISM band 2.405-2.48GHz operation
- simple SPI communication interface
- integrated 20MHz and 32.768 oscillator circuitry

Functional Description

The PmodRF2 provides RF support for applications at data rates of 250kbps (IEEE 802.15) or 625kbps (Turbo mode). It is designed for use with the Microchip microcontroller families (PIC18, PIC24, dsPIC33, and PIC32) and the ZigBee ®, MiWi™, and MiWi P2P software stacks all available for download at the Microchip website: www.microchip.com/wireless.

Interface

The primary communications interface with the PmodRF2 is an SPI bus on J1. The PmodRF2 is implemented as a slave device in SPI mode (0, 0), which requires SCK to idle in a low state and the ~CS pin to be held low during communication. An RST pin provides the host with an active low, asynchronous hardware reset for the PmodRF2. The PmodRF2 also provides a configurable polarity interrupt (default active low) indicator pin (INT), which is asserted by the PmodRF2 when data is available for the host device. The INT line is de-asserted after the INTSTAT register is read.

Interface Connector Signal Description

Connector J1 – SPI Communications		
Pin	Signal	Description
1	~CS	Chip Select
2	SDI	Serial Data In
3	SDO	Serial Data Out
4	SCK	Serial Clock
5	GND	Power Supply Ground
6	VCC	Power Supply (3.3V)
7	INT	Interrupt Output
8	~RST	Hardware Reset
9	WAKE	Hardware Wake
10	NC	Not Connected
11	GND	Power Supply Ground
12	VCC	Power Supply (3.3V)

The SPI interface standard uses four signal lines. These are chip select (~CS), serial data in (SDI), serial data out (SDO), and serial clock (SCK). These signals map to the following signals on the MRF24J40: ~CS corresponds to the Chip Select signal (~CS), SDI corresponds to Serial Data Input (SDI), SDO corresponds to Serial Data Output (SDO), and SCK corresponds to the Serial Clock signal (SCK).

Power Supply

The PmodRF2 is designed to work with Digilent microcontroller boards that have 12-pin header connectors.

The PmodRF2 requires a 2.7V-3.6V supply voltage. A 3.3V power supply voltage is available on all Digilent system boards and is provided as part of the 12-wire Pmod interface standard.

Digilent system boards with Pmod interface connectors allow jumper selection of the power supply voltage to be provided to the Pmod.

WARNING: Ensure that the system board is jumpered to provide 3.3V to the module before applying power to the board.

For more information on the MRF24J40, see the MRF24J40 datasheet at the Microchip web site.

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