SiFLEX01 Transceiver Module

Block Diagram / Theory of Operation - Confidential

Last updated
Monday, January 30th, 2012

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1 Introduction

1.1 Purpose & Scope

The purpose of this document is to provide a description of the SiFLEX01 radio module's Block Diagram and Theory of Operation.

1.2 Revision History

Date	Change Description	Revision
1/30/2012	Initial release.	1.0

Table 1 Revision History

2 Block Diagram

The block diagram for the SiFLEX01 Radio Module is presented below.

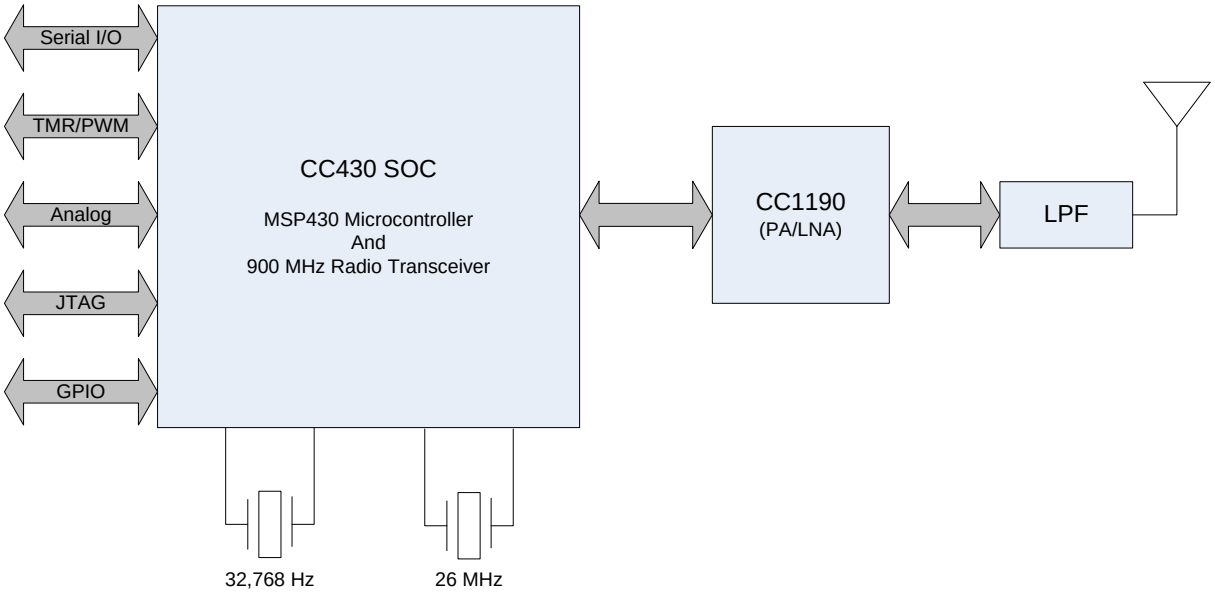


Figure 1 - SiFLEX01 Block Diagram

3 Theory of Operation

The SiFLEX01 Module is a radio module that implements a sub-1 GHz Texas Instruments CC1101 radio transceiver and a Texas Instruments MSP430 microcontroller into a CC430 SOC (System on Chip). The radio transceiver is supported by a FEM (Front End Module), which implements a Power Amplifier (PA) and Low-Noise Amplifier (LNA). A low pass filter is included on the common path between the FEM and the antenna terminal. All of the radio functions use an on-module 26 MHz crystal oscillator as the frequency reference. An additional on-module 32 kHz crystal oscillator is used for low-power operation of the on-chip MSP430 microcontroller.

The radio features a low-IF receiver. The received RF signal is amplified by a LNA and down-converted in quadrature to the intermediate frequency (IF). The I and Q signals are digitized at the IF. Automatic gain control (AGC), fine channel filtering, and demodulation bit/packet synchronization are performed digitally.

The transmitter part is based on direct synthesis of the RF frequency. The frequency synthesizer includes a completely on-chip LC VCO and a 90 degrees phase shifter for generating the I and Q LO signals to the down-conversion mixers in receive mode.

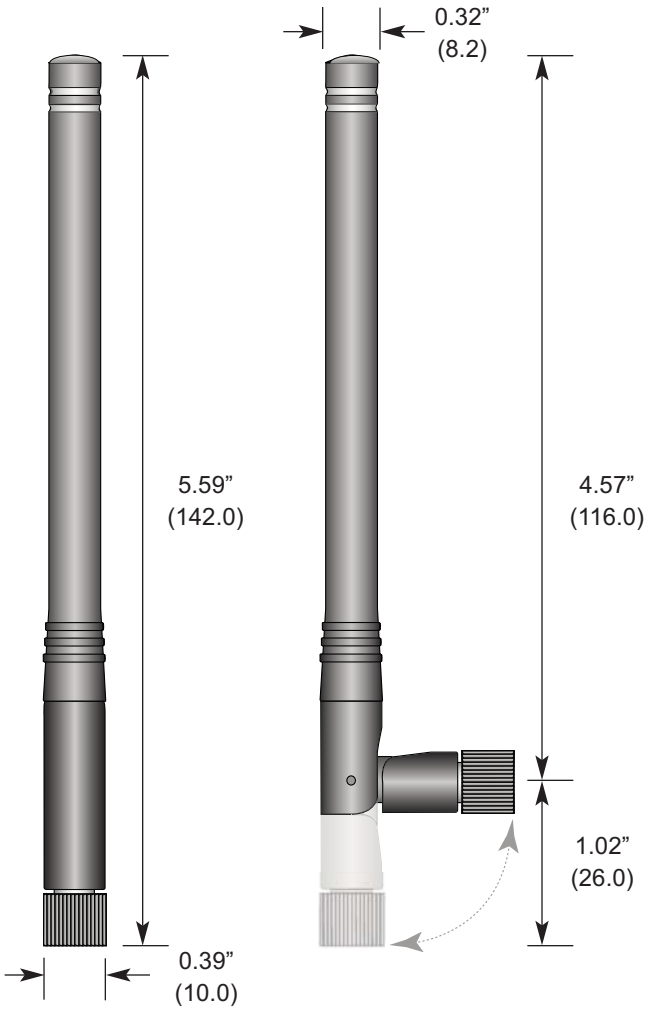
The 26 MHz crystal oscillator generates the reference frequency for the synthesizer, as well as clocks for the ADC and the digital part.

A digital baseband includes support for channel configuration, packet handling, and data buffering.

A memory mapped register interface is used for data access, configuration, and status request by the microcontroller.

ANTENNA FACTOR™ ANT-916-CW-HWR-xxx DATA SHEET

Product Dimensions



Description

HWR Series 1/2-wave center-fed dipole antennas deliver outstanding performance in a rugged and cosmetically attractive package. The articulating base allows the antenna to tilt 90 degrees and rotate 360 degrees. The antenna's internal counterpoise eliminates external ground plane dependence and maximizes performance. HWR Series antennas attach via a standard SMA or Part 15 compliant RP-SMA connector. Custom colors and connectors are available for volume OEM customers.

Features

- Internal counterpoise
- Low cost
- Tilts and rotates
- Omni-directional pattern
- Outstanding VSWR
- Rugged & damage-resistant
- Standard SMA or Part 15 compliant RP-SMA connector
- Custom colors and terminations for volume OEMs
- Internal O-ring seal on connector

Electrical Specifications

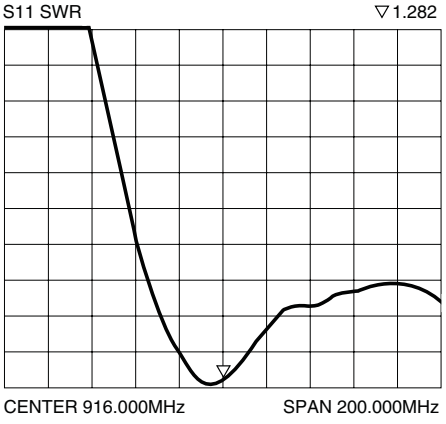
Center Freq.	916MHz
Recmd. Freq. Range	900-930MHz
Wavelength	1/2-wave
VSWR	<2.0 typ. at center
Impedance	50 ohms
Connector	RP-SMA or SMA

Electrical specifications and plots measured on 4.00” x 4.00” reference ground plane

Ordering Information

- ANT-916-CW-HWR-RPS (with RP-SMA connector)
- ANT-916-CW-HWR-SMA (with SMA connector)

Polar Plot & Gain Information



Typical VSWR

Antenna Factor 159 Ort Lane Merlin, OR 97532 **www.antennafactor.com**
541-956-0931 (phone) 541-471-6251 (fax)

Rev 07-26-10

902 MHz – 928 MHz Dipole 2dBi Antenna for Reverse Polarity SMA

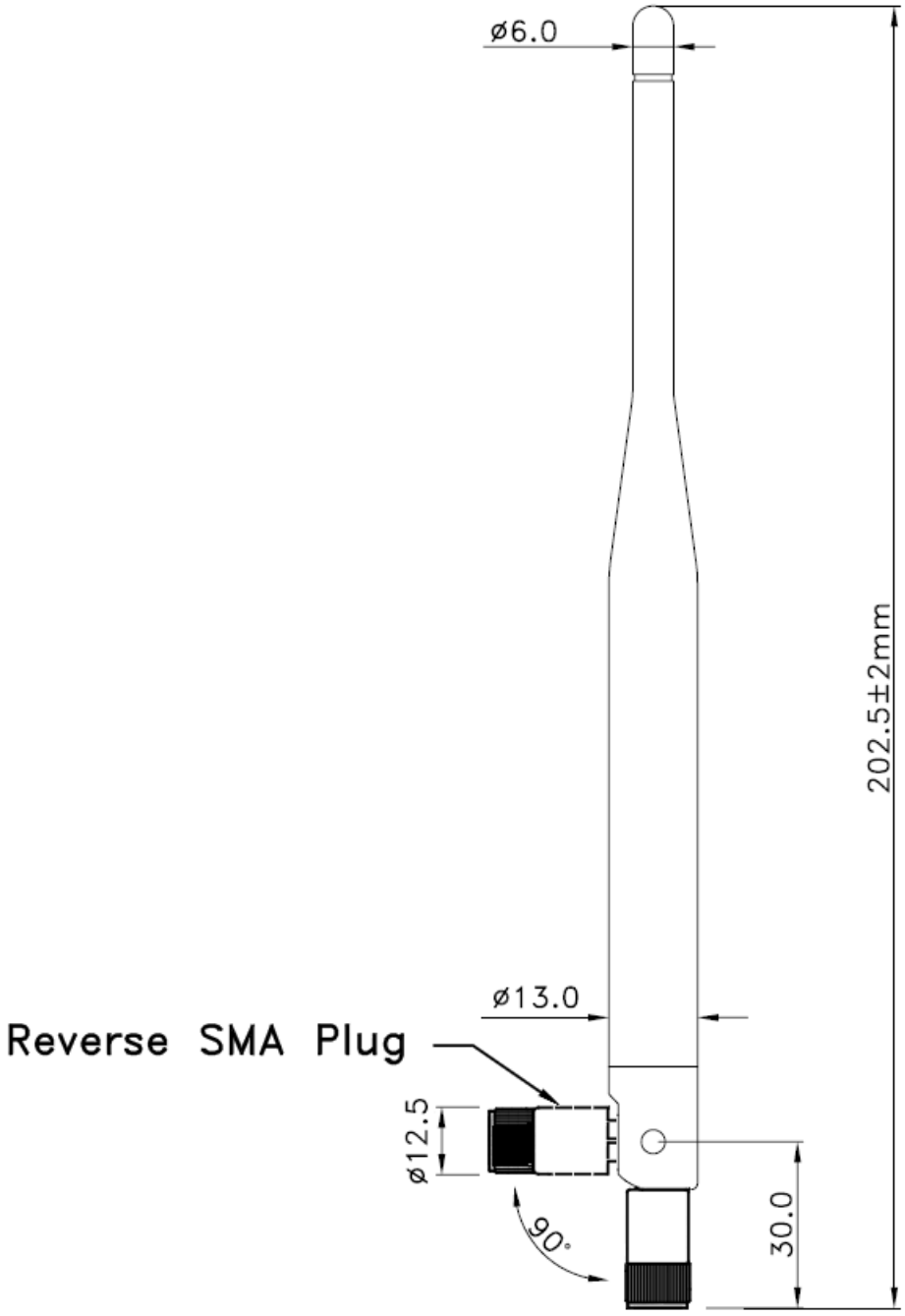
ORDERING INFORMATION

Order Number	Description
001-0002	900 MHz dipole antenna for reverse polarity SMA connector.

SPECIFICATIONS

Specification	Value
Gain	+2 dBi
Impedance	50 ohms
Type	Dipole
Polarization	Linear Vertical
VSWR	≤2.5：1
Frequency	~902-928 MHz centered at 915 MHz
Weight	13g
Size	210×10 mm
Antenna Color	Black

PHYSICAL DIMENSIONS (MM)



ANTENNA MEASUREMENTS

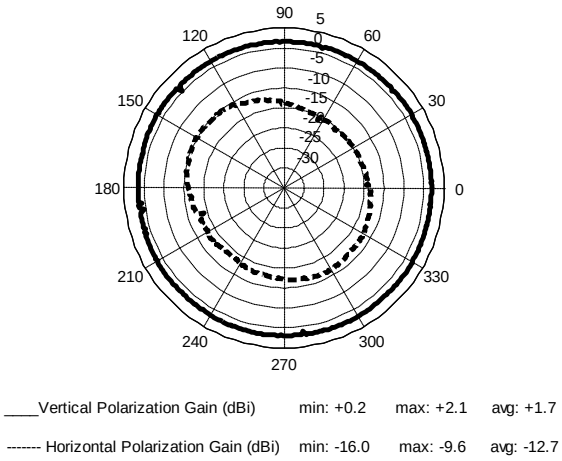


Figure 1 Extended Position, Vertical

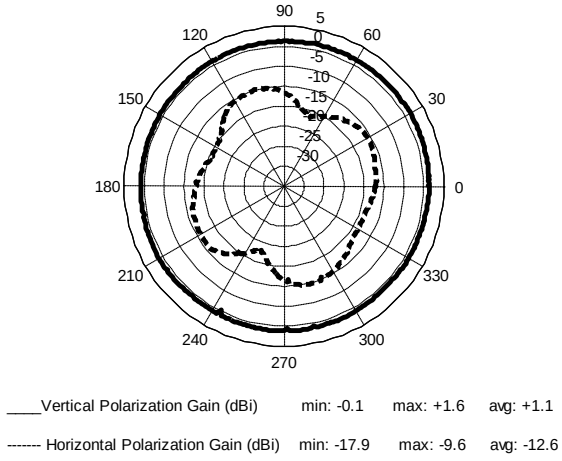


Figure 2 Folded Position, Vertical

CONTACTING LS RESEARCH

Headquarters	LS Research, LLC W66 N220 Commerce Court Cedarburg, WI 53012-2636 USA Tel: 1(262) 375-4400 Fax: 1(262) 375-4248
Website	www.lsr.com
Technical Support	support@lsr.com
Sales Contact	sales@lsr.com

