Theory of Operation

The TiWi Module is a radio module that implements an 802.11 b/g/n WLAN (Wireless Wide Area Network) transceiver. A Texas Instruments WL1271 SOIC (System on Integrated Circuit) has a transceiver that implements WLAN function. The radio section is supported by a FEM (Front End Module, which implements the Power Amplifier Section (PA). All of the radio functions use an on-module 38.4 MHz Temperature Compensated Crystal Oscillator (TCXO) as the station frequency reference. The radio is supported by an on-chip ARM cortex processor. An external 32 kHz clock signal is applied externally for low-power operation of the on-board communications ARM processor. The data source/sink and command interface for the WLAN transceiver is an SDIO (Secure Digital Input-Output).

The WLAN transceiver section is based on a direct-conversion vector (I-Q) transmitter and receiver architecture. The local oscillator is generated at four times the carrier frequency, phase-locked, and divided by four for the quadrature LO injections.   The transmitter signal is routed to the FEM and amplified by the PA section and the antenna terminal is duplexed between the WLAN transmitter and WLAN receiver using a single-pole triple-throw (SPTT) switch. The WLAN receive section is fully realized in the SOIC and the FEM only provides a passive transmission path through the SPTT. A bandpass filter is included on the common path between the SPTT and the antenna terminal.

The radio transceiver and station reference (38.4 MHz TCXO) power supplies are provided by on-module voltage regulators.

The FM transmitter and Receive as well as BT transceiver functions are not currently supported and the module is not certified for their application.