

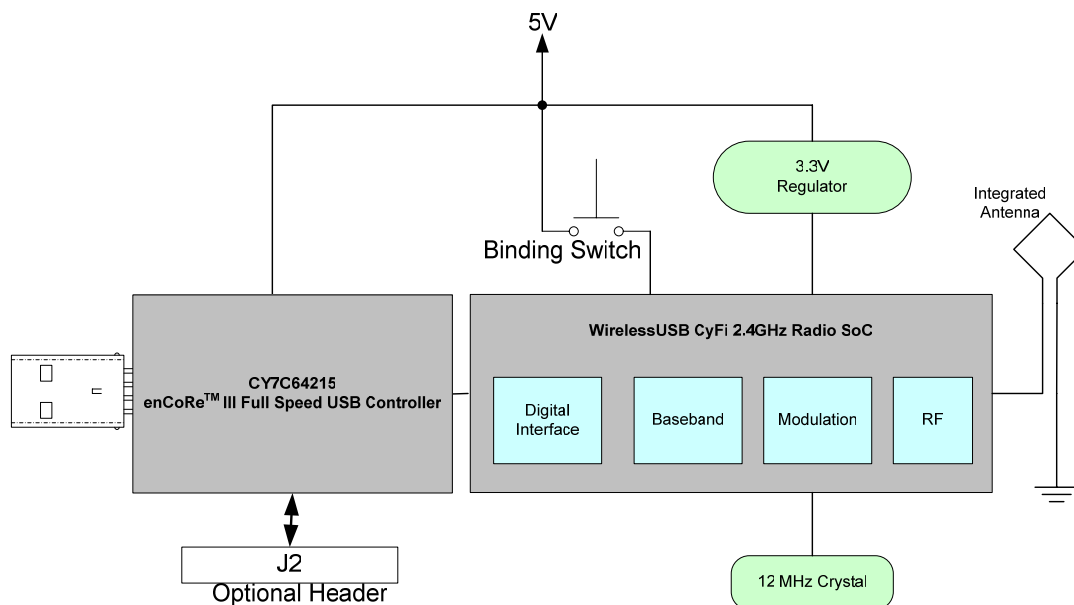
### Circuit Details

The AWAC24U Module provides a complete USB to RF antenna wireless MODEM. The module is designed to implement wireless device links operating in the worldwide 2.4-GHz ISM frequency band. It is intended for systems compliant with world-wide regulations covered by ETSI EN 301 489-1 V1.41, ETSI EN 300 328-1 V1.3.1 (Europe), FCC CFR 47 Part 15 (USA and Industry Canada) and TELEC ARIB(Japan).

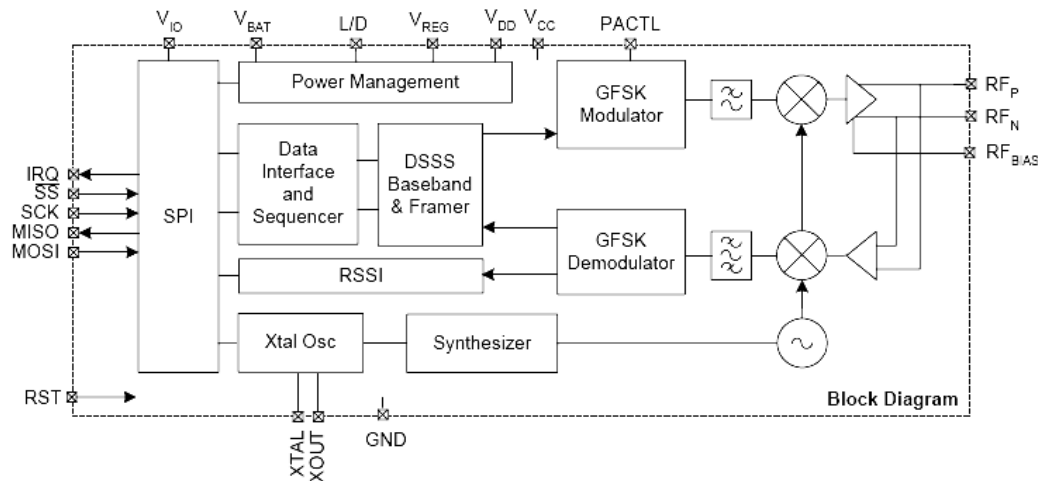
The module contains a 2.4-GHz 1-Mbps GFSK radio transceiver, packet data buffering, packet framer, DSSS baseband controller, Received Signal Strength Indication (RSSI), and SPI interface for data transfer and device configuration.

The radio supports 98 discrete 1-MHz channels (regulations limit the use of some of these channels in certain jurisdictions, check datasheets or contact Artaflex for more details). In DSSS modes the baseband performs DSSS spreading/de-spreading, while in GFSK Mode (1 Mb/s - GFSK) the baseband performs Start of Frame (SOF), End of Frame (EOF) detection and CRC16 generation and checking. The baseband may also be configured to automatically transmit Acknowledge (ACK) handshake packets whenever a valid packet is received.

When in receive mode, with packet framing enabled, the device is always ready to receive data transmitted at any of the supported bit rates, except SDR, enabling the implementation of mixed-rate systems in which different devices use different data rates. This also enables the implementation of dynamic data rate systems, which use high data rates at shorter distances and/or in a low-moderate interference environment, and change to lower data rates at longer distances and/or in high interference environments.



**Figure 1 - Module Block Diagram**



**Figure 2 - Radio Chip Simplified Block Diagram**

The radio network stack runs on an Encore III Microcontroller chip by cypress. Encore III support full speed USB and connect to the PC to receive data from user application. Encore III communicate with the radio using a SPI bus interface. Encore III runs on 5V, and needs no external oscillator. An onboard regulator step down the DC power to 3.3V for the Radio Chip. The unpopulated J2 header can be used to power and debug the hardware, with few software modifications.

The Radio crystal runs at 12MHz to provide reference to the internal synthesizer. A tactile switch is provided to bind the radio to other hosts in the CiFy network. It can be programmed for any other operation as well.