gram filters and other components of the encoding module **342**, decoding module **352**, pre-decoding module **350** and RF front end **346** in accordance with the particular RFID standardized protocol of the user interface devices currently communicating with the millimeter wave transceiver **29**. However, if communication device **10** or **30** operates in accordance with a single protocol, this flexibility can be omitted. One or more of the protocol processing module **340**, encoding module **342**, digitization module **348**, decoding module **352**, and pre-decoding module **350** can be implemented via a shared baseband processing module **190**.

[0068] In operation, once the particular protocol has been selected for communication by communication device **10** or **30**, the protocol processing module **340** generates and provides digital data to be communicated to the millimeter wave transceiver **121** to the encoding module **342** for encoding in accordance with the selected protocol. This digital data can include commands to power up the millimeter wave transceiver **121**, to read user data or other commands or data used by the remote RFID devices **109** or **111** or communication device **10** or **30** in association with its operation. By way of example, but not limitation, the RFID protocols may include one or more line encoding schemes, such as Manchester encoding, FM**0** encoding, FM**1** encoding, etc. Thereafter, in the embodiment shown, the digitally encoded data is provided to the digital-to-analog converter **344** which converts the digitally encoded data into an analog signal. The RF front-end **346** modulates the analog signal to produce an RF signal at a particular carrier frequency that is transmitted via antenna **360** to one or more remote RFID devices **109** or **111**. Antenna **360**, when implemented as part of RF IC **50** or **70** can be a on-chip coil such as a near-field coil or other antenna.

[0069] The RF front-end **346** further includes transmit blocking capabilities such that the energy of the transmitted RF signal does not substantially interfere with the receiving of a back-scattered or other RF signal received from one or more remote RFID devices **109** or **111** via the antenna **360**. Upon receiving an RF signal from one or more user remote RFID devices **109** or **111**, the RF front-end **346** converts the received RF signal into a baseband signal. The digitization module **348**, which may be a limiting module or an analog-to-digital converter, converts the received baseband signal into a digital signal. The predecoding module **350** converts the digital signal into an encoded signal in accordance with the particular RFID protocol being utilized. The encoded data is provided to the decoding module **352**, which recaptures data, such as user data **102** therefrom in accordance with the particular encoding scheme of the selected RFID protocol. The protocol processing module **340** processes the recovered data to identify the object(s) associated with the user interface device(s) and/or provides the recovered data to the server and/or computer for further processing.

[0070] Millimeter wave transceiver **121** includes a power generating circuit **240**, an oscillation module **244**, a processing module **246**, an oscillation calibration module **248**, a comparator **250**, an envelope detection module **252**, an on-chip coil **262**, a capacitor C**1**, and a transistor T**1**. The oscillation module **244**, the processing module **246**, the oscillation calibration module **248**, can be implemented with separate components or in a shared baseband processing module, such a baseband processing module **190**.

[0071] In operation, the power generating circuit **240** generates a supply voltage (V_{DD}) from a radio frequency (RF) signal that is received via antenna **254**. The power generating circuit **240** stores the supply voltage V_{DD} in capacitor C**1** and provides it to modules **244**, **246**, **248**, **250**, **252**.

[0072] When the supply voltage V_{DD} is present, the envelope detection module **252** determines an envelope of the RF signal, which includes a DC component corresponding to the supply voltage V_{DD}. In one embodiment, the RF signal is an amplitude modulation signal, where the envelope of the RF signal includes transmitted data. The envelope detection module **252** provides an envelope signal to the comparator **250**. The comparator **250** compares the envelope signal with a threshold to produce an inbound symbol stream.

[0073] The oscillation module **244**, which may be a ring oscillator, crystal oscillator, or timing circuit, generates one or more clock signals that have a rate corresponding to the rate of the RF signal in accordance with an oscillation feedback signal. For instance, if the RF signal is a 900 MHz signal, the rate of the clock signals will be n*900 MHz, where "n" is equal to or greater than 1.

[0074] The oscillation calibration module **248** produces the oscillation feedback signal from a clock signal of the one or more clock signals and the stream of recovered data. In general, the oscillation calibration module **248** compares the rate of the clock signal with the rate of the stream of recovered data. Based on this comparison, the oscillation calibration module **248** generates the oscillation feedback to indicate to the oscillation module **244** to maintain the current rate, speed up the current rate, or slow down the current rate.

[0075] The processing module **246** receives the stream of recovered data and a clock signal of the one or more clock signals. The processing module **246** interprets the stream of recovered symbols to determine data, command or commands contained therein. The command may be to store data, update data, reply with stored data, verify command compliance, read user data, an acknowledgement, etc. If the command(s) requires a response, the processing module **246** provides a signal to the transistor T**1** at a rate corresponding to the RF signal. The signal toggles transistor Ti on and off to generate an RF response signal that is transmitted via the antenna. In one embodiment, the millimeter wave transceiver **121** utilizes a back-scattering RF communication to send data that includes user data such as user data **102** or **103**.

[0076] The millimeter wave transceiver **121** may further include a current reference (not shown) that provides one or more reference, or bias currents to the oscillation module **244**, the oscillation calibration module **248**, the envelope detection module **252**, and the comparator **250**. The bias current may be adjusted to provide a desired level of biasing for each of the modules **244**, **248**, **250**, and **252**.

[0077] FIG. **12** is a top view of a coil **330** in accordance with the present invention. As shown, the first turns **332** includes metal bridges **334** and **336** to couple various sections of the winding together. In particular a top view of coil **330**, such as coil **360** and/or coil **262** is shown as included in a portion of RF IC **50** or **70**. The first turn is on dielectric layer **338**, while the metal bridges **334** and **336** are on a lower dielectric layer, which enables the first turns to maintain their symmetry. Optional removed dielectric sections **333** and **335** are shown that provides greater magnetic coupling to the second turns that are below. The removed dielectric sections **333** and **335** can be removed using a microelectromechanical systems (MEMS) technology such as dry etching, wet etching, electro discharge machining, or using other integrated circuit fabrication techniques. The remaining elements of the coil **330** can