## Operational Description

## FCC ID: TNE-430LMA1

| Label | Description |
|---|---|
| IC1 | Translates TRF6900A commands and signals to CC1020 SPI commands in real time |
| IC2 | Single chip low power RF transceiver for narrowband systems |
| Q1<br>R9<br>LD1 | PLL locked – inverts the active low LOCK signal out of the CC1020. LED LD1 gives visual PLL lock indication. |
| TCX01 | External clock for the CC1020 |
| IC3 | RF switch – switches the antenna between the receive and transmit circuits |
| FL1 | SAW filter |
| IC4 | D/A converter used to generate the RSSI signal |
| R2<br>R3<br>C6 to C8 | PLL loop filter |
| R10<br>C1<br>C3<br>L1<br>L2 | Impedance matching network |
| C71<br>C72<br>L70<br>L71 | LC filter |
| C9<br>C13<br>L4 | Additional and optional LC filter |

The module is a PCB in the form of a 28 pin DIP. The module must be supported and configured by a host on which it is either plugged into sockets or soldered in place. The module is based on the Texas Instruments CC1020 RF chip.

The module is configurable (via 0 ohm jumper resistors) to operate in one of two forms:

- TRF6900A emulation. In this form the Microchip PIC18F2410 intercepts TRF6900A configuration data and signals and translates them into corresponding CC1020 configuration in real time. The configuration data is communicated over an SPI interface. The signals include MODE and STANDBY. The MODE signal selects one of two configuration sets. Typically, one set is configured to transmit and the other is configured to receive. The STANDBY signal switches between power down and operational states. The D/A converter is used to emulate the TRF6900A RSSI_OUT analog signal, and follows the instantaneous RSSI signal as read from the CC1020 registers.
- Native CC1020. In this form, the CC1020 is configured and controlled directly by the host via an SPI interface. The CC1020 contains 52 1-byte registers that are used to control and monitor the device.

## Operational Description

## FCC ID: TNE-430LMA1

In both forms the following apply:

- The CC1020 is configured to operate the RF switch via the LNA_EN and PA_EN signals which are automatically set according to the transmit/receive state of the chip.
- The CC1020 LOCK signal (active low) indicates that the PLL is locked. This signal is inverted by Q1 and R9 to produce the (active high) output LOCKDET signal. LED LD1 provides a visual lock detect indication.

All frequency determining circuitry is contained on the module. The circuitry is electrically identical for all operating frequencies within the authorized frequency band. Data registers within the Chipcon CC1020 RF Chip and are programmed at the factory with a set number of user selectable channels within the frequency band for which authorization is sought. This allows the user to select any channel within the authorized frequency range. This does not allow the user to select a frequency outside of the authorized frequency range.