

*CX2200 is assembled from these modules before shipment.* The details of the CM2200 and CI2200 are covered below:

### **CM2200 Theory of Operation**

The CM2200 contains two active devices, U1 and U2.

U1 is a TR1000 ASH hybrid transceiver, manufactured by RF Monolithics, Inc. The TR1000 operates at 916.5 MHz using OOK modulation. The TR1000 utilizes *amplifier-sequenced hybrid* technology for data reception and a *SAW-stabilized 916.5 MHz oscillator* with modulated buffer amplifier for data transmission. Please refer to Pages 4, 5, 6 and 7 of the TR1000 Data Sheet for the detailed theory of operation of the TR1000. With respect to certification under FCC 152.49, the TR1000 has the following special characteristics:

- Amplifier-sequenced hybrid (ASH) receiver technology is *inherently non-radiating*. There are no local oscillators or super-regenerative oscillators used in this type of receiver. When receiving, RF amplifiers are switched on/off with a 667 kHz low power bias switching signal, which is not emitted by the hybrid. Please refer to Mr. John Reed's letter, FCC Letter – ASH RX.pdf, with respect to the FCC's finding on this characteristic.
- The output power of the transmitter is determined by the value of resistor R2. The *transmitter power cannot be changed by software commands* from the host microprocessor to the ASH transceiver. As there is no transmitter duty-cycle restrictions under FCC 15.249 regulations, various software versions could be loaded into the CM2200 without affecting its compliance with FCC 15.249 regulations.

The output power of the TR1000 will be adjusted on a certified OP-1 test range so that the transmitted field strength of the CX2200 assembly will be in accordance with FCC 15.249 limits.

U2 is a low current PIC 16LF876A microcontroller, manufactured by Microchip. The 16LF876A contains an internal CPU clock that is stabilized by an external 10 MHz crystal. RF leakage from the internal CPU oscillator is below all applicable FCC Part 15 limits.

### **CI2200 Theory of Operation**

The CI2200 is the Interface Module part of the CX2200 Transceiver Assembly. Referring to the CI2200 Schematic, the CI2200 provides two basic functions:

- Regulates and routes DC power to the CM2200 and CI2200 circuitry.

- Routes the serial I/O pins from the CM2200 to an RS232 level converter or a UART-USB bridge IC.

The active devices on the CI2200 include three ICs, U1, U2 and U3. U1 is a Silicon Labs CP2101 USB bridge IC. RF leakage from the CP2101 is below all applicable FCC Part 15 limits. U2 is a Maxim MAX3232 CMOS to RS232 interface circuit. RF leakage from the MAX3232 is also below all applicable FCC Part 15 limits. U3 is a 3.0 V linear voltage regulator that contains no RF generators.