More capability, fewer components, lower system costs

Markets
- Broadband Wireless
- Fiber Optic
- Satellite

Applications
- Cellular Basestations
- High-speed satellite communications
- High-capacity wireless internet infrastructure
- Point-to-point wireless networks
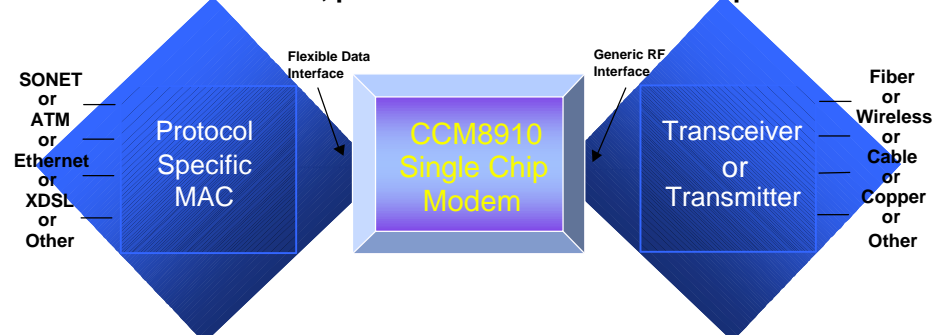- Fiber Optic FDM Transport

Benefits
- Integrated full duplex single chip modem
  - Minimizes power consumption
  - Minimizes BOM costs
  - Maximizes reliability
- Mature design enables rapid product development
  - Evaluation kit supports demo, performance testing, lab testing
- Optimizes link capacity and bit error rate performance
  - Embedded BERT for remote link diagnostics
  - Monitors errors of link or channel
- Supports data rates up to 800 Mbps
- Can support BPSK to 256-QAM Modulation

Advanced networks require advanced solutions. Success of networking products is dependent on the emergence of a whole new class of semiconductor devices that reduce CAPEX and OPEX. Power your system with CarrierComm's single chip modem engine. The CCM8910 is designed with the end-to-end solution in mind and includes built-in functions such as bit-error-rate (BERT) and sophisticated clock and data recovery circuitry for user data. Integrated system features such as I/Q mismatch correction and DC offset removal are just a couple of examples of integrated system functions that simplify system design and reduce overall system costs. Where solutions for high speed modem engines were once the domain of expensive multiple chip set solutions or field programmable gate arrays; CarrierComm's communication silicon technology is now able to integrate full duplex operation into a single piece of silicon for high speed networks running from DC to Gigabit data rates. CarrierComm's flexible and programmable architecture allows system designers to optimize power consumption, symbol rates, and coding/puncture rates which ultimately enables higher levels of integration and brings the benefits of Moore's law to network communications.
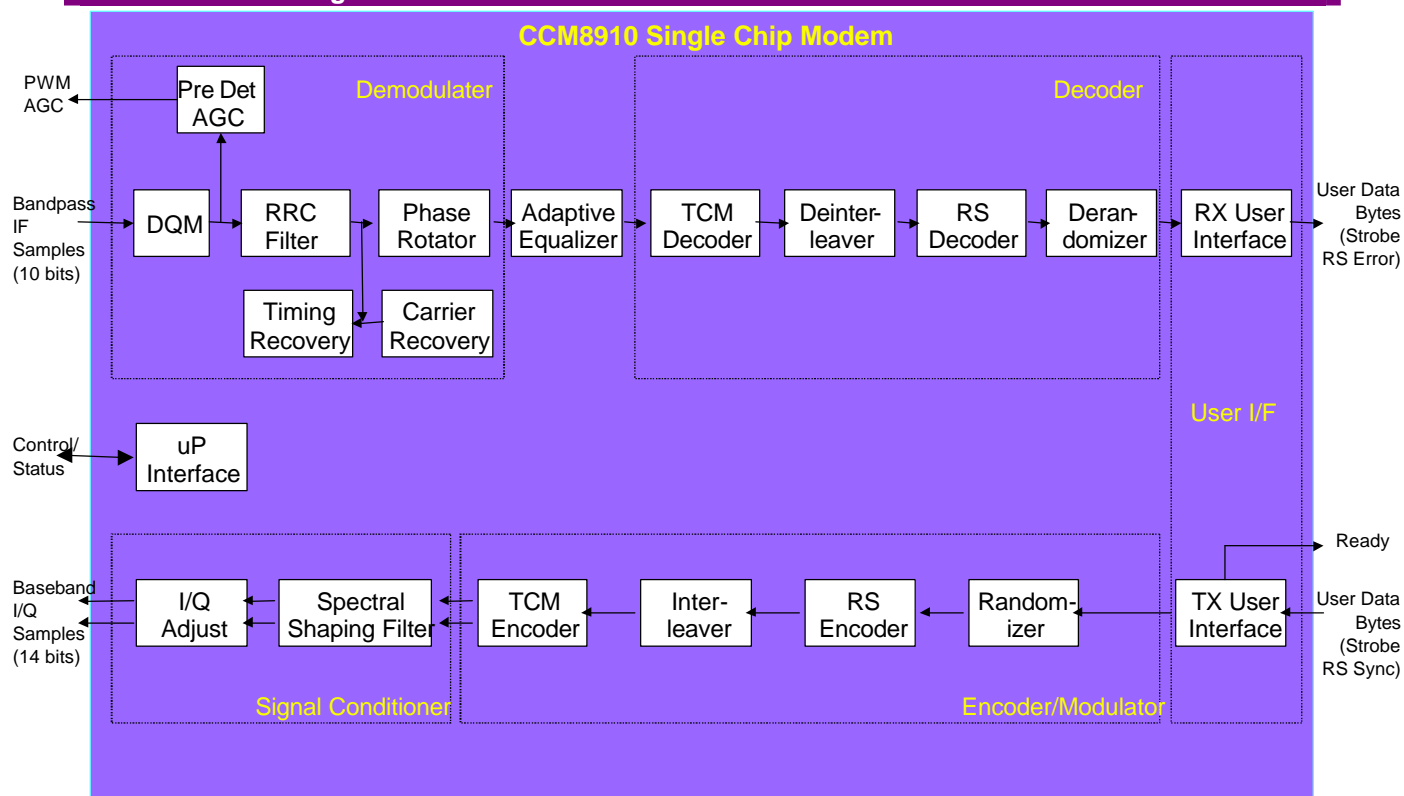
- **CCM8910 Single Chip Modem incorporates**
  - **Matched Filters**
  - **Equalizer**
  - **Modulator/Demodulator**
  - **Interleaver/Deinteleaver**
  - **Encoder/Decoder**
  - **User Interface**

Single Chip full-duplex flexible QAM/PSK Modulator/Demodulator, protocol and transmission independent

SONET
or
ATM
or
Ethernet
or
XDSL
or
Other

Flexible Data Interface

Protocol Specific MAC

CCM8910 Single Chip Modem

Generic RF Interface

Transceiver or Transmitter

Fiber
or
Wireless
or
Cable
or
Copper
or
Other

Power Consumption: approximately 2 Watts at SDH rates
Package: 388 pin BGA

CCM8910 Single Chip Modem

Demodulater

PWM AGC ← Pre Det AGC

Bandpass IF Samples (10 bits) → DQM → RRC Filter → Phase Rotator → Adaptive Equalizer

Timing Recovery → Carrier Recovery

Decoder

TCM Decoder → Deinter-leaver → RS Decoder → Deran-domizer → RX User Interface → User Data Bytes (Strobe RS Error)

Control/ Status → uP Interface

User I/F

Baseband I/Q Samples (14 bits) ← I/Q Adjust ← Spectral Shaping Filter ← TCM Encoder ← Inter-leaver ← RS Encoder ← Random-izer ← TX User Interface

Signal Conditioner

Encoder/Modulator

Ready

User Data Bytes (Strobe RS Sync)

CCM8910 Features

- Supports BPSK modulation up to 256 QAM
- Data rates up to 311 Mbps supported
- Symbol rates up to 120 MBaud available
- Blind Equalizer; dual modes; fast locking
- Integrated Functions simplifying system design and reducing costs
  - Corrects for Transmit and Receive I/Q mismatches (I/Q imbalance adaptation)
  - BERT (Bit Error Rate Tester) for remote link diagnostics
  - Channel Error Rate for link performance monitoring
  - DC Offset Removal reduces system cost
  - Digital Timing and carrier recovery
  - Utilizes square root raised cosine spectral shaping, $\alpha = 0.20$ to $\alpha = 0.50$
  - Predistortion to remove nonlinearities
- Bit Error Rate (BER) 10^{-12} or better supported
- Incorporates Forward Error Correction (FEC) Codes
  - Requires lower signal to noise ratio
  - Trellis Coded Modulation offers high coding gain
  - Concatenated Reed Solomon coding designed to be compliant with Intelsat standards
- Convolutional/TCM and Reed Solomon code rates programmable
- SONET compliant user data clock recovery
- Recovered Tx Baud Clock and Rx Bit Clock synchronizes to transmit data clock and supplies received data clock
- Intelsat Earth Station compatible
- Bandwidth to support In-Band Control or Overhead Channel
- Selectable randomization available
- Commercial temperature of 0-70°C
- Up to 180 MHz sample clock
- 388 pin BGA package
- Control using 8-bit parallel bus
- High level of integration reduces overall system power consumption