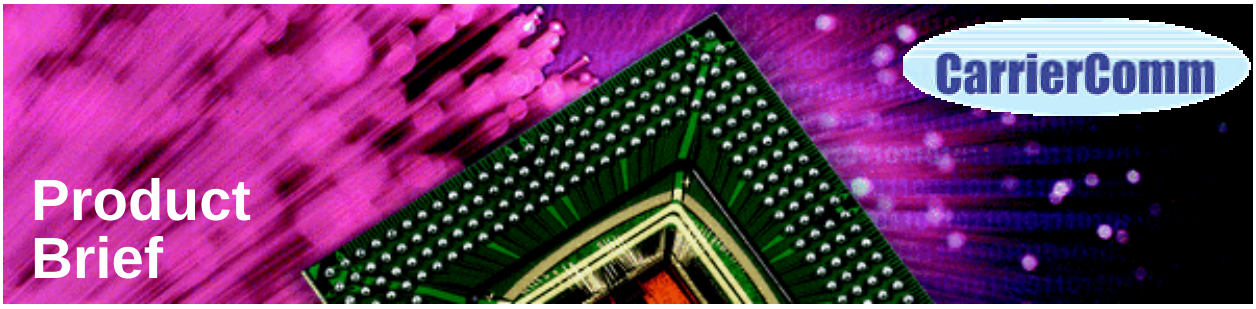


TNS8820 **Single Chip Modem**

More capability, fewer components, lower system costs

Markets
- Broadband Wireless
- Fiber Optic
- Satellite

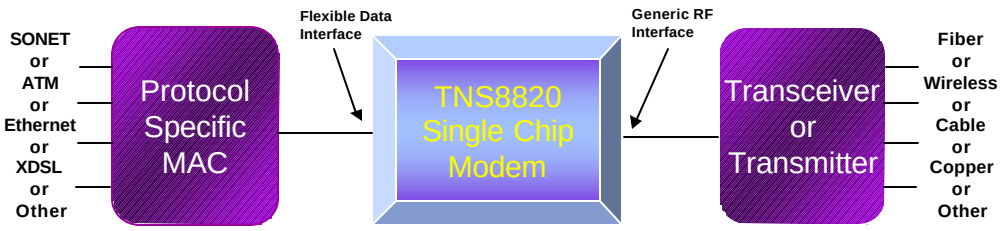
Applications
- Cellular Basestations
- High-speed satellite communications
- High-capacity wireless internet infrastructure
- Point-to-point wireless networks
- Fiber Optic FDM Transport

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
- Can support multiple data rates up to 220 Mbps

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 TNS8820 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. 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.

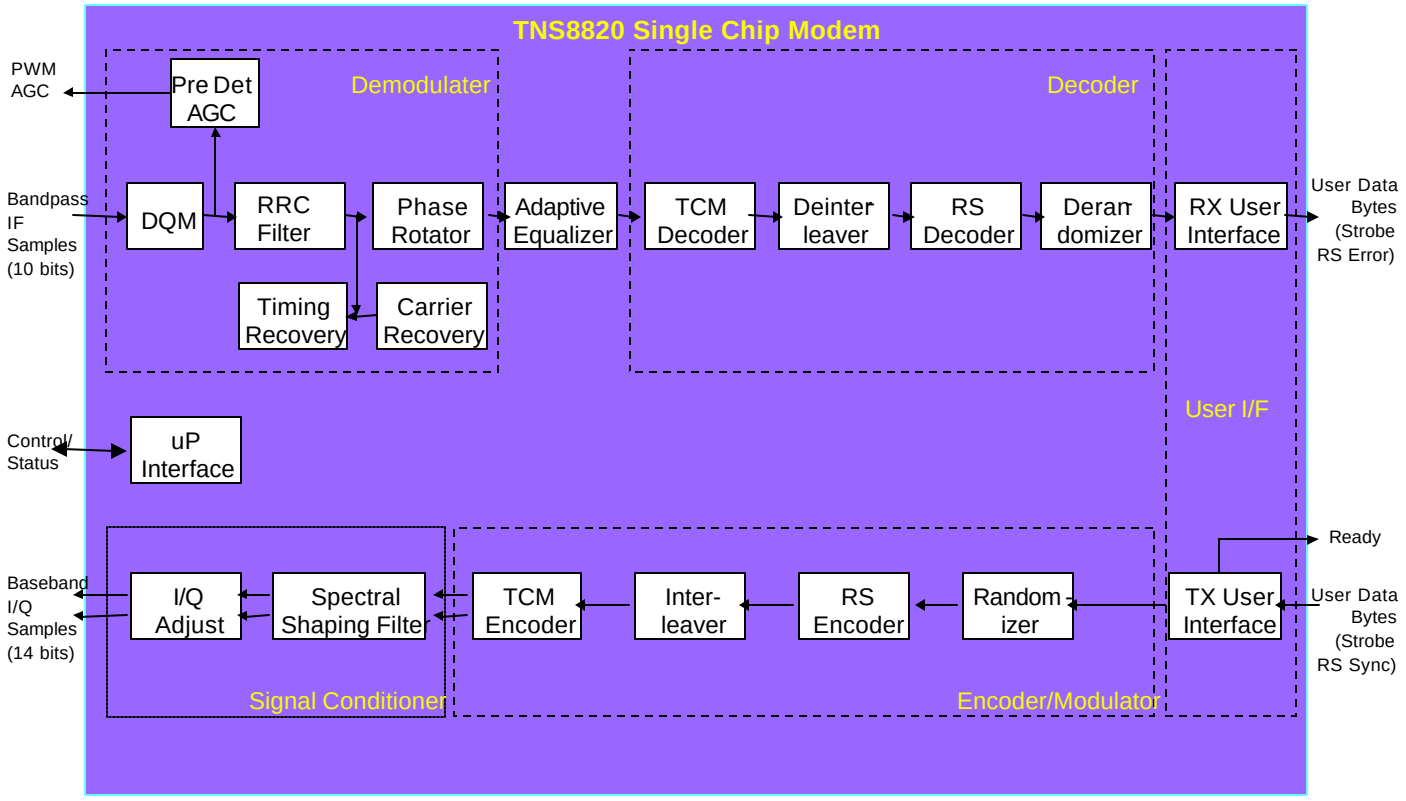
- **TNS8820 Single Chip Modem incorporates**
  - **Matched Filters**
  - **Equalizer**
  - **Modulator/Demodulator**
  - **Interleaver/Deinteleaver**
  - **Encoder/Decoder**
  - **User Interface**

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



Power Consumption: approximately 4 Watts
Package: 352 pin BGA

TNS8820 Block Diagram



TNS8820 Features

- Supports BPSK modulation up to 64 QAM
- Data rates up to 220 Mbps supported
- Symbol rates up to 72 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
  - TCM code based on industry standard k = 7, r = 1/2 code
  - 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 100 MHz sample clock
- 352 pin BGA package
- Control using 8-bit parallel bus
- High level of integration reduces overall system power