



Z i L O G

# Z02922

## Transaction Processing Modem Data Pump with Integrated AFE

PB008801-1201

Product Brief

### Simple Block Diagram

Parallel I/F	DSP	ADC
8KW ROM V.22bis/V.23/ V.22/V.21 Bell 212A/103 V.29	237W RAM	DAC
		OSC
	512W RAM	Eye Pattern I/F

### Features

Device	Data Pump AFE	Speed (MHz)
Z02922	16-Bit Integrated	12.228

- Combined data pump and Analog Front-End (AFE)
- Half-duplex data modem throughput to 9600 bps
  - ITU V.29 and V.29 Quick Connect™ 9600 bps
  - ITU V.29 and V.29 Quick Connect™ 7200 bps
- Full-duplex data modem throughput to 2400 bps
  - ITU V.22bis, V.23, V.22, V.21
  - Bell 212A and Bell 103
- FSK (V.23 1200/75 bps, V.21/Bell 103 300 bps), DPSK (V.22/Bell 212A 1200bps), or QAM encoding (V.22bis 2400bps)
- V.29 Quick Connect handshake performs line turnaround in less than 50 milliseconds
- Automatic handshake plus full manual control over handshake timings

- Scrambler/descrambler functions plus selectable control over internal data pump functions
- Programmable Bi-Quad tone detectors for call-progress tone detection
- Adaptive equalization to compensate for a wide variety of line conditions
- Programmable transmit attenuation and selectable receive threshold
- Fully programmable call-progress detectors, signal quality detectors, tone detectors, tone generators, and transmit signal levels which aid in rapid country qualifications
- Host port allows direct parallel interface to standard 8-bit microprocessors
- HDLC framing at all speeds
- On-chip peripherals
  - Full-Duplex voice band AFE with 12-Bit resolution
  - Synchronous serial interface port
  - Eye pattern interface
- Low power consumption: 50 mA typical
- 44-Pin PLCC package
- Single +5 VDC power supply
- 0° to +70° C commercial temperature range

**Note:** International Telecommunications Union (ITU), formerly CCITT.

Connection	Circuit	Device
Power	V <sub>CC</sub>	V <sub>DD</sub>
Ground	GND	V <sub>SS</sub>

## General Description

The Z02922 TransPro™ is a synchronous single-chip modem solution that enables construction of either a V.22bis modem capable of 2400 bps full-duplex, or a 9600 bps half-duplex over dial-up lines. The Z02922 is specifically designed for use in embedded modem applications where space, performance, and low power consumption are key requirements.

The Z02922 TransPro includes a Quick Connect handshake option that allows the user to make handshakes in 50 milliseconds or less. This feature is especially useful in transaction processing applications such as credit card terminals and network access controllers, where a small amount of data is transmitted.

Operating over the Public Switched Telephone Network (PSTN), the Z02922 TransPro™ meets the modem standards for V.29, V.22bis, V.22, V.23, V.21, Bell 212A, and Bell 103.

The Z02922 includes automatic handshakes, and also includes manual control over handshake timings. Manual handshake control allows the user to develop handshakes for specific requirements, such as for some point of sale equipment that includes custom handshakes.

A typical modem application can be created by simply adding a control microprocessor (Host), phone line interface, and DTE interface (see Figure 1).

The Z02922 TransPro performs HDLC framing at all speeds. This capability eliminates the requirement for an external Serial Input/Output (SIO) device for Data Terminal Equipment (DTE) in products incorporating error control.

All modulation, demodulation, filtering, A/D and D/A conversion functions for transmit and receive are provided on-chip. Automatic and selectable compromise equalizers are included to optimize performance over a wide range of line types.

The Z02922 device compensates for a wide variety of adverse line conditions by using a combination of fixed link, fixed cable, and adaptive equalizers.

The Z02922 provides comprehensive selectable and programmable tone generation and detection.

All digital I/O signals are TTL compatible. The parallel interface is compatible with standard 8-bit microprocessors, allowing direct access to eight I/O registers and indirect access to the modem RAM.

The RAM access capability allows the Host to retrieve diagnostic data, modem/line status and control data, and set programmable coefficients. The serial interface is used for data transfer. All control and status information is transferred by means of the parallel interface.

The Z02922 transmit drivers and receive amplifiers can be connected directly to a Data Access Arrangement (DAA) by means of a transformer. Completing this connection reduces the external circuits to a minimum.

In addition, the Z02922 offers further system level savings by providing built-in filters for both the Transmitter Analog Output and the Receiver Analog Input, thus eliminating the requirement for external filtering components.

The Z02922 device operates on a single +5 VDC power supply. During periods of no traffic, the Host can place the modem into SLEEP mode, reducing power consumption to less than 1 percent of full load power.

Power connections follow conventional descriptions below:

Connection	Circuit	Device
Power	$V_{CC}$	$V_{DD}$
Ground	GND	$V_{SS}$

Figure 1 illustrates the Z02922 block diagram.

## Block Diagram

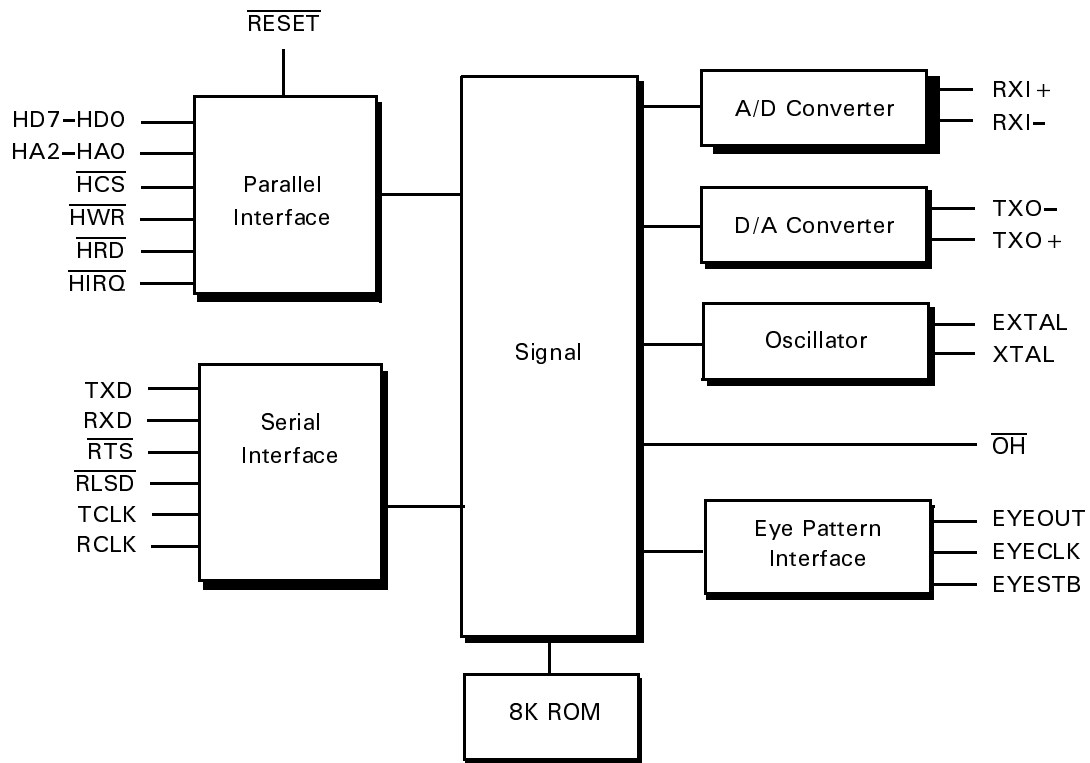


Figure 1. Z02922 Block Diagram

## Pin Outs and Directions

Figure 2 illustrates the Pin assignments for Z02922 44-Lead PLCC. Table 1 describes the Pin number, its symbol, and the Input/Output direction

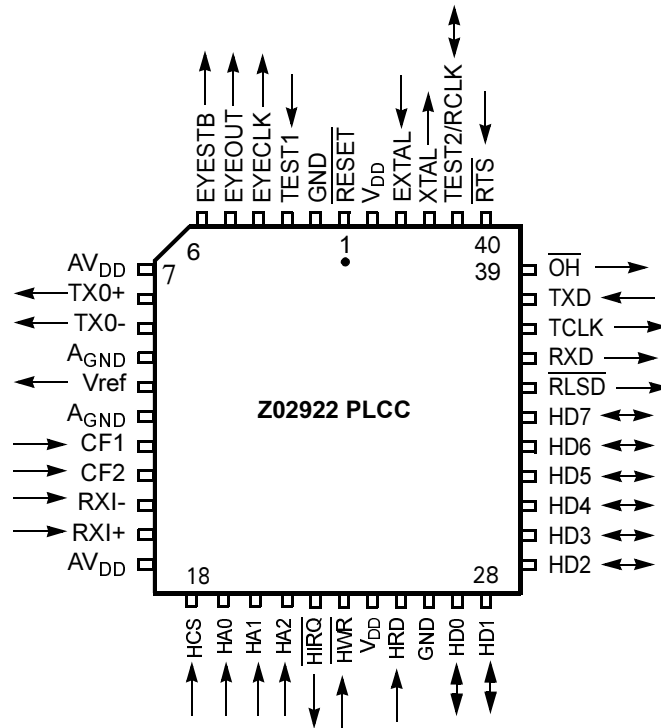


Figure 2. Z02922 44-Lead PLCC Pin Assignments

## Ordering Information

### Z02922 12.288 MHz 44-Pin PLCC

ROM Code Version 0x42                      Z0292212VSCR3910

ROM Code Version 0x3A                      Z0292212VSCR3796

Refer to the Z02922 Product Update (<http://www.softart.ca/products/2922err7.pdf>) for software differences between the two ROM code versions. The Product Update also list workarounds for Version 0x3A of the ROM code.

For fast results, contact your local ZiLOG sales office for assistance in ordering this part.