# XRT73L12

## TWELVE-CHANNEL E3/DS3/STS-1 LINE INTERFACE UNIT

*APRIL 2002* *REV. P1.0.0*

## GENERAL DESCRIPTION

The XRT73L12 is a Twelve-Channel fully integrated Line Interface Unit (LIU) for E3/DS3/STS-1 applications. It incorporates twelve independent Receivers and Transmitters in a single 432 pin TBGA package.

Each channel of the XRT73L12 can be configured to operate in E3 (34.368 MHz), DS3 (44.736 MHz) or STS-1 (51.84 MHz) rates that are independent of each other. Each transmitter can be turned off and tri-stated for redundancy support and power conservation.

The XRT73L12's differential receivers provide high noise interference margin and are able to receive the data over 1000 feet of cable, or with up to 12 dB of cable attenuation.

The XRT73L12 provides a Parallel Microprocessor Interface for programming and control.

The XRT73L12 supports local, remote and digital loop-backs. The XRT73L12 also contains an on-board Pseudo Random Binary Sequence (PRBS) generator and detector with the ability to insert and detect single bit error.

### FEATURES

***Receiver:***

- On chip Clock and Data Recovery circuit for high input jitter tolerance
- Meets E3/DS3/STS-1 Jitter Tolerance Requirements
- Detects and Clears LOS as per G.775
- Receiver Monitor mode handles up to 20 dB flat loss with 6 dB cable attenuation
- On chip B3ZS/HDB3 encoder and decoder that can be either enabled or disabled
- On-chip Clock Synthesizer generates the appropriate rate clock from a single frequency Crystal
- Provides low jitter clock outputs for either E3, DS3 or STS-1 rates
- Meets Jitter Tolerance Requirements, as specified in ITU-T G.823_1993 for E3 Applications
- Meets Jitter Tolerance Requirements, as specified in Bellcore GR-499-CORE for DS3 Applications

***Transmitter:***

- Compliant with Bellcore GR-499, GR-253 and ANSI T1.102 Specification for transmit pulse
- Tri-state Transmit output capability for Redundancy applications
- Transmitters can be turned on or off

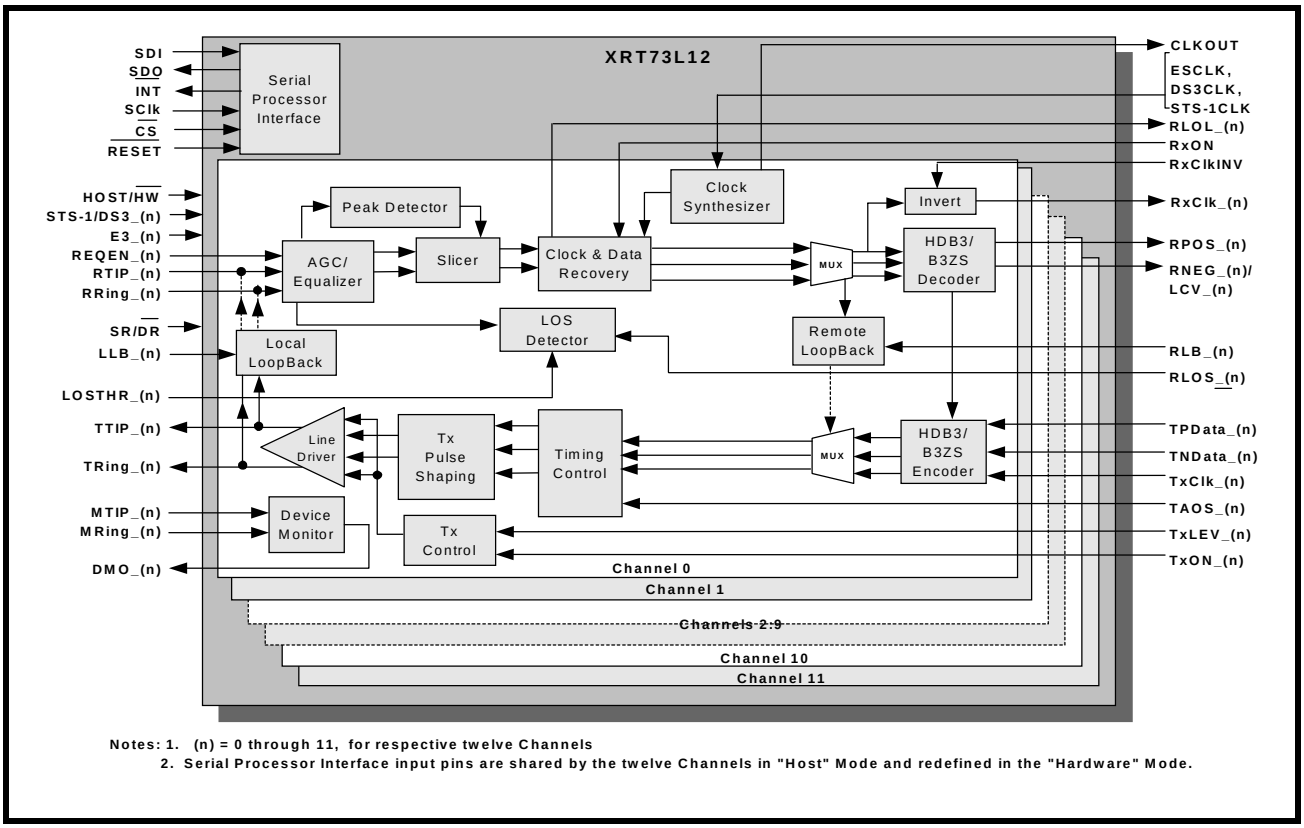
***Control and Diagnostics:***

- 5 wire Serial Microprocessor Interface for control and configuration
- Supports optional internal Transmit Driver Monitoring
- PRBS Error Counter Register to accumulate errors
- Hardware Mode for control and configuration
- Supports Local, Remote and Digital Loop-backs
- Single 3.3 V ± 5% power supply
- 5 V Tolerant I/O
- Available in 432 ball TBGA
- -40°C to 85°C Industrial Temperature Range

### APPLICATIONS

- E3/DS3 Access Equipment
- STS1-SPE to DS3 Mapper
- DSLAMs
- Digital Cross Connect Systems
- CSU/DSU Equipment
- Routers
- Fiber Optic Terminals

**FIGURE 1. BLOCK DIAGRAM OF THE XRT73L12**




Notes: 1. (n) = 0 through 11, for respective twelve Channels
2. Serial Processor Interface input pins are shared by the twelve Channels in "Host" Mode and redefined in the "Hardware" Mode.

### *Transmit Interface Characteristics*

- Accepts either Single-Rail or Dual-Rail data from Terminal Equipment and generates a bipolar signal to the line
- Integrated Pulse Shaping Circuit
- Built-in B3ZS/HDB3 Encoder (which can be disabled)
- Accepts Transmit Clock with duty cycle of 30%-70%
- Generates pulses that comply with the ITU-T G.703 pulse template for E3 applications
- Generates pulses that comply with the DSX-3 pulse template, as specified in Bellcore GR-499-CORE and ANSI T1.102_1993
- Generates pulses that comply with the STSX-1 pulse template, as specified in Bellcore GR-253-CORE
- Transmitter can be turned off in order to support redundancy designs

### *Receive Interface Characteristics*

- Integrated Adaptive Receive Equalization for optimal Clock and Data Recovery
- Declares and Clears the LOS defect per ITU-T G.775 requirements for E3 and DS3 applications
- Declares Loss of Signal (LOS) and Loss of Lock (LOL) Alarms
- Built-in B3ZS/HDB3 Decoder (which can be disabled)
- Recovered Data can be muted while the LOS Condition is declared
- Outputs either Single-Rail or Dual-Rail data to the Terminal Equipment

## ORDERING INFORMATION

| PART NUMBER | PACKAGE | OPERATING TEMPERATURE RANGE |
|---|---|---|
| XRT73L12IB | 432 ball TBGA | -40°C to +85°C |