

**CIRRUS LOGIC<sup>®</sup>**

**CS61310/18**

## **T1/E1 Line Interface Units**

The following information is based on the technical data sheet:

*CS61310 DS440PP2 AUG '99*

*CS61318 DS441PP2 AUG '99*

Please contact Cirrus Logic for further information.

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***CRYSTAL*<sup>®</sup>**  
**PRODUCT INFORMATION**

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PI440PP1 OCT'99

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For further information on Cirrus Logic products, please visit our website "www.cirrus.com" or call our literature department (800) 888-5016 ext. 3594 or (512) 912-3594 for data sheets and application notes.

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## *T1/E1 Line Interface Units*

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### **Features**

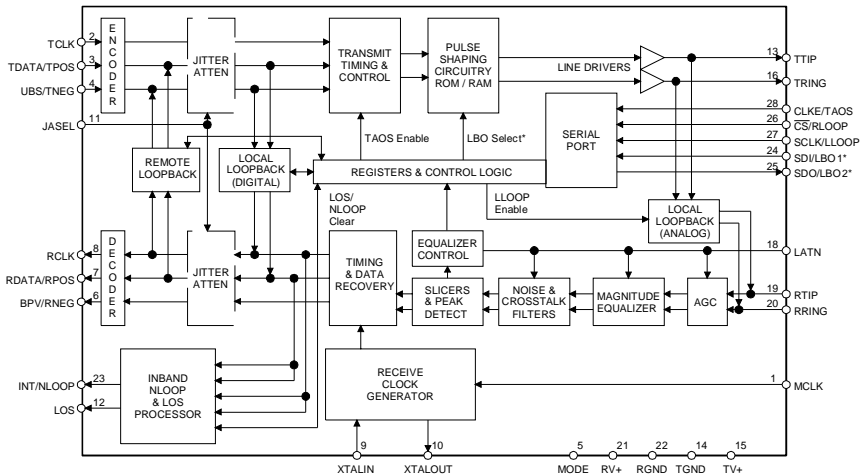
- No Crystal Needed for AT&T 62411/TBR-12 Jitter Attenuation
- Arbitrary Waveform Generator for User Programmable Pulse Shapes
- TX Driver High Impedance / Low Power Control
- Generation and Detection of Loop Up / Loop Down Signaling
- Selectable Unipolar or Bipolar I/O
- Line Quality Monitoring
- Alarm Indication Signal (AIS) generation and Loss of Signal (LOS) Monitoring Compliant to ANSI T1.231B/ITU-TG.775
- 28 PLCC and 28 PDIP
- Data sheets available for applicable international specifications

### **Description**

The CS61310 and CS61318 are Long Haul T1 and E1 primary rate line interface units (LIUs), respectively. They combine the complete analog transmit and receive circuitry for single, full-duplex interfaces at T1 (CS61310) and E1 (CS61318) rates. The devices are drop-in replacements for the Level One LXT310 T1 LIU (CS61310) and LXT318 E1 LIU (CS61318).

Both devices feature crystal-less jitter attenuation compliant to AT&T 62411 (CS61310) and TBR-12/13 (CS61318), user programmable pulse shapes, network loopback signal generation and detection, line quality monitoring, and LOS and AIS monitoring in all modes. Both can be operated in hardware mode, or can be interfaced with a Motorola or Intel processor via the devices' serial port for host mode operation. Both devices are available in 28-pin PLCC

and 28-pin PDIP packages, operating at 5V over industrial temperature ranges of -40 degrees to +85 degrees Celsius. Customer Evaluation Kits are available for both devices.



\* : LBO Select, LBO1 and LBO2 only available on CS61310.

## Overview

Cirrus Logic's Crystal<sup>®</sup> T1/E1 Interface Units (LIUs) have been the short-haul LIU of choice for over a decade. Building on this legacy, Cirrus has expanded its Crystal LIU family to include the CS61310 and CS61318 for T1-only and E1-only Long Haul applications (respectively). The devices differ from short-haul LIUs by reliably operating over cable segments extending to ~6000 feet without a repeater. This distance is approximately nine times longer than the cable segments supported by traditional short haul LIUs. Consequently, these devices are suitable for applications, like base stations, that require voice/data transmissions over long distances. Other target applications for these devices include CSU/DSU interfaces, Digital Loop Carriers (DLCs), remote terminals, and HDSL extensions. These devices have been released to high volume production. For in-depth details regarding theory of operation, please view the respective product data sheets.

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## Benefits

Customers will gain the following benefits when they replace their LXT310/318 with the CS61310/318:

- Crystal-less Jitter Attenuation: This feature reduces system cost because the CS61310/318 were designed to meet stringent jitter attenuation specs without the expense of external circuitry.
- User Programmable Pulse Shapes: This feature allows the user to program the CS61310/318 to compensate for pulse degradation caused by non-standard cables, transformers, or protection circuitry. As a result, the customer saves the time and money associated with tweaking the analog hardware design to achieve T1/E1 pulse shape compliance. In some applications, this feature allows the user to reduce the T1/E1 pulse amplitude as a means to save power.
- Network Loopback Signal Generation and Detection(Loop Up/Loop Down): These features support enhanced link diagnostics and error detection without requiring human intervention at the far end.
- Line Quality Monitor: The CS61310/318's line quality monitor provides the highest line quality resolution of any LIU on the market. Consequently, the user has a much more accurate picture of the line condition.
- LOS and AIS Monitoring Available In All Modes: The user has the flexibility of using either hardware or host mode to monitor the CS61310/318's LOS and AIS status.

## Target Applications

- Telecom Base Stations
- CSU/DSU Interfaces
- Digital Loop Carriers
- HDSL Extensions

## FAQs

- 1) Is the CS61310 a drop-in replacement for the LXT310, requiring no circuit changes?
- A: The use of the CS61310 device in a previously-LXT310 socket requires only one change. The values of the transmit resistors should be changed to 9.1 ohms from the LXT310 requirement of 12.5 ohms. However, if common mode noise is an issue, then Cirrus recommends the addition of a 0.47 uF capacitor on the receive circuit (see CS61310 data sheet).
- 2) Is the CS61318 a drop-in replacement for the LXT318, requiring no circuit changes?
- A: Yes! A CS61318 device can be used in an previously LXT318 socket with NO changes to the circuit. However, if common mode noise is an issue, then Cirrus recommends the addition of a 0.47 uF capacitor on the receive circuit (see CS61318 data sheet).
- 3) Are there any software changes required when replacing the LXT310/318 with the CS61310/318?
- A: No! There are NO software changes required to use the CS61310/318 in the same manner as the Level One equivalents. However, the CS61310/318 do offer additional functionality, beyond the capabilities of the respective Level One devices. If the user wishes, they may add to their software to make use of the features they will gain when using a Cirrus device:
- AIS detection
  - Arbitrary Waveform Generation
  - Loop Up / Loop Down signal generation
  - Independent power saving modes for the transmitter and receiver
  - Software access to equalizer gain settings

Upon power-up of the Cirrus devices in a previously-Level One socket, the above-listed features will default to inactive. They will remain inactive unless a write occurs to the registers at addresses (HEX) 11, 12, and 13. These registers do NOT exist on the respective Level One devices.

- 4) Does Cirrus plan to support the CS61310/318 parts for long term production?
- A: Yes! Cirrus has just released these parts to high volume production, in order to provide a superior and long-term alternative to existing long-haul LIU's currently on the market.

### **Ordering Information**

CS61310-IL	28-pin PLCC
CS61310-IP	28-pin PDIP
CS61318-IL	28-pin PLCC
CS61318-IP	28-pin PDIP
CDB61310	Customer Evaluation Kit, CS61310
CDB61318	Customer Evaluation Kit, CS61318



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