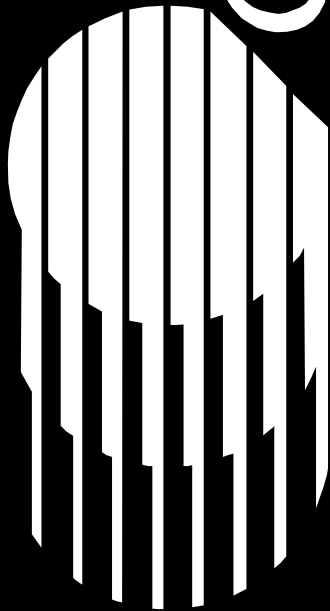


**CIRRUS LOGIC®**



**CS61581**

**CRYSTAL™**

# T1/E1 Universal Line Interface

The following information is based on the technical datasheet:

*CS61581 DS211PP3 NOV '97*

Please contact Cirrus Logic :  
Communications Products Division for further  
information.

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## **COMMUNICATIONS PRODUCT DIVISION PRODUCT INFORMATION**

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PI211PP1 JAN '98





## CS61581 Features

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### **CRYSTAL™** T1/E1 Universal Line Interface

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#### Features

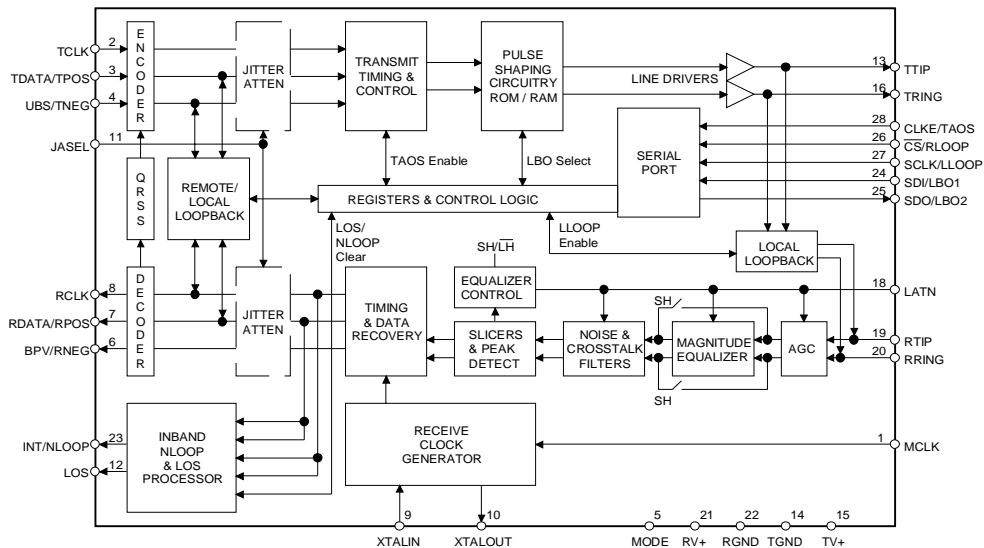
- Provides T1 and E1, Long Haul and Short Haul Line Interface
- Provides a QRSS Test Signal and Error Detector
- Impedance Matching Line Driver Using a Single Transformer (optional)
- No Crystal Needed for Jitter Attenuation
- Meets AT&T 62411 and CTR-12 Jitter Tolerance and Attenuation Requirements
- Meets ANSI T1.231B Requirements for LOS and AIS
- Meets the BS6450 Transmitter Short-Circuit Requirements for E1 Applications
- Compliant with:
  - ITU-T Recommendations: G.703, G.704, G.706, G.732, G.775 and I.431
  - American National Standards (ANSI): T1.102, T1.105, T1.403, T1.408, and T1.231
  - FCC Rules and Regulations: Part 68 and Part 15
  - AT&T Publication 62411
  - ETSI ETS 300 011, 300 233, CTR 12, TBR 13
  - TR-NET-00499



## CS61581 Description

### Description

The CS61581 is a primary rate line interface unit capable of operation in both short haul (intraoffice) and long haul applications. The CS61581 combines the complete analog transmit and receive circuitry for a single, full-duplex interface at T1 and E1 rates. The device is pin and function compatible with the Level One LXT310 and LXT318. Enhanced functionality is available through an extended register set allowing short haul operation, custom pulse shape generation, QRSS pattern generation, detection and error counting, and generation and detection of loop up and loop down codes. The CS61581 features Crystal's low-power impedance-matched line drivers and crystalless jitter attenuation.



### Overview

The CS61581 Universal Line Interface supports T1 and E1 data rates for both short haul and long haul applications. The transmitter outputs all pulse shapes for T1 and E1 applications, and matches the standard line impedances with a single turns ratio transformer. When configured for long haul operation, the receiver uses gain and equalization to provide 40 dB of sensitivity. The receiver reconfigures for short haul operation, limiting the receive sensitivity to meet industry specifications.



## **CIRRUS LOGIC® CS61581 Pin and Function Compatibility**

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The CS61581 can be operated in stand-alone hardware interface mode, or by a microcontroller in serial host mode. Additional functionality is available in host mode including both short-haul and long-haul operational modes. Upon power up, the CS61581 defaults to long-haul mode with the driver set for low impedance for LXT310, 317, 318 compatibility. The LIU can be reconfigured via the serial port to support multiple modes of operation; T1 or E1, long haul or short haul. Additional functionality available in host mode includes: QRSS generator and receiver capable of transmitting the industry standard T1 and E1 data patterns in either the transmit or receive directions, a data pattern error count register, network loopback detection and generation, impedance matching driver, custom pulse shape generation, and receive signal level detection.

### **Pin and Function Compatibility**

#### ***Drop-in replacement for LXT310, LXT317, LXT318***

The CS61581 is pin and function compatible with Level One's LXT310 T1, LXT317 DECT, and LXT318 E1 devices. Customers can now modify their existing long-haul only designs to include short-haul functionality simply by changing to the CS61581 and modifying the software that controls the LIU. Customers can also take advantage of the crystalless jitter attenuator offered on the CS61581 and reduce costs by eliminating the crystal or at least replacing the pullable crystal with a less expensive part.

#### ***The CS61581 vs LXT360***

The CS61581 and Level One's LXT360 are functionally similar, but not pin compatible (though the pinouts are nearly the same). The CS61581 meets or exceeds all the pertinent specifications, and has several advantages over the LXT360:

- the jitter attenuator is CRT12 compliant when the CS61581 is set for E1 operation,
- the CS61581 offers impedance matching driver, matching 75  $\Omega$ , 100  $\Omega$  and 120  $\Omega$  impedances depending on the pulse shape selected, no external resistors needed in transmit path,
- detects receiver input signal levels to 2 dB resolution,
- meets ISDN LOS signal level requirements for T1 and E1 ISDN PRI applications,



## CS61581 Ordering Information

- the ability to generate and receive test patterns in both directions thereby allowing testability into the system as well as the network,
- QRSS sync indicated by register bit,
- data pattern errors are counted and stored in an internal register,
- the ability to generate user programmable custom pulse shapes,
- the ability to output a 6 V pulse required for applications using external passive LBO equalizers,
- software control of power down and transmitter tristate functions.

### **Universal LIU and T1 or E1 Framer**

For those applications that require framing, Crystal offers framers for T1 and E1 applications, the CS62180B and the CS62181, respectively. These framers, when combined with the CS61581 Universal LIU compare favorably in functionality and board space required for most applications. The Crystal Universal LIU/framer combination is a much less expensive solution compared to the price points of the combo LIU/framer parts offered by the several manufacturers. Additionally, the superior performance levels and enhanced features offered by the CS61581 provide numerous advantages to the customer.

### **Ordering Information**

CS61581-IL      28-pin PLCC

CS61581-IP      28-pin PDIP

Please visit our website "[www.crystal.com](http://www.crystal.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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