14-CHANNEL T1/E1/J1 LONG-HAUL/SHORT-HAUL LINE INTERFACE UNIT

MARCH 2003 *REV. P1.0.1*

GENERAL DESCRIPTION

The XRT83L314 is a fully integrated 14-channel long-haul and short-haul line interface unit (LIU) that operates from a single 3.3V power supply. Using internal termination, the LIU provides one bill of materials to operate in T1, E1, or J1 mode independently on a per channel basis with minimum external components. The LIU features are programmed through a standard microprocessor interface. EXAR's LIU has patented high impedance circuits that allow the transmitter outputs and receiver inputs to be high impedance when experiencing a power failure or when the LIU is powered off. Key design features within the LIU optimize 1:1 or 1+1 redundancy and non-intrusive monitoring applications to ensure reliability without using relays.

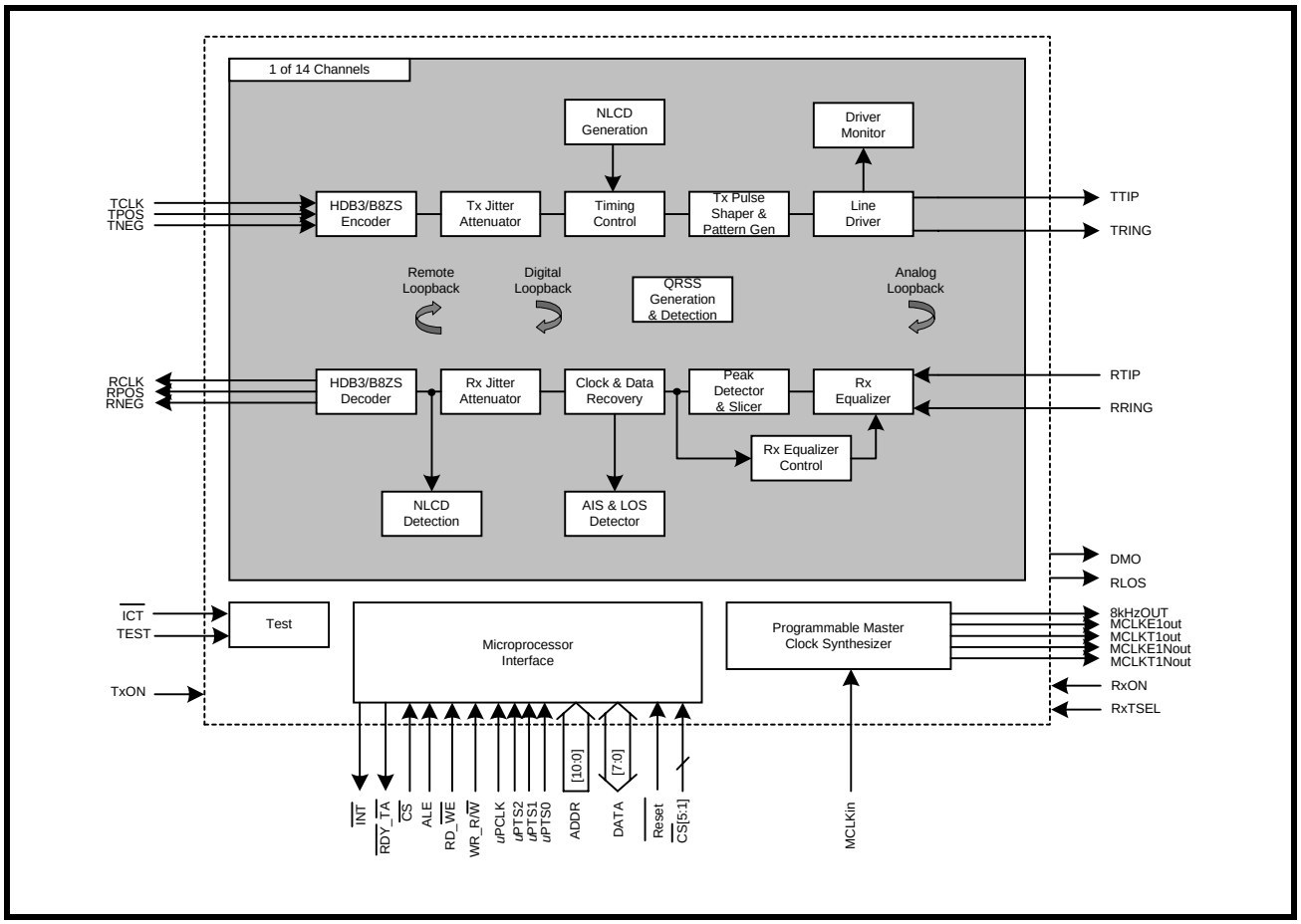
The on-chip clock synthesizer generates T1/E1/J1 clock rates from a selectable external clock frequency and has five output clock references that can be used for external timing (8kHz, 1.544Mhz, 2.048Mhz, nxT1/J1, nxE1).

Additional features include RLOS, a 16-bit LCV counter for each channel, AIS, QRSS generation/detection, Network Loop Code generation/detection, TAOS, DMO, and diagnostic loopback modes.

APPLICATIONS

- T1 Digital Cross Connects (DSX-1)
- ISDN Primary Rate Interface
- CSU/DSU E1/T1/J1 Interface
- T1/E1/J1 LAN/WAN Routers
- Public Switching Systems and PBX Interfaces
- T1/E1/J1 Multiplexer and Channel Banks
- Integrated Multi-Service Access Platforms (IMAPs)
- Integrated Access Devices (IADs)
- Inverse Multiplexing for ATM (IMA)
- Wireless Base Stations

FIGURE 1. BLOCK DIAGRAM OF THE XRT83L314



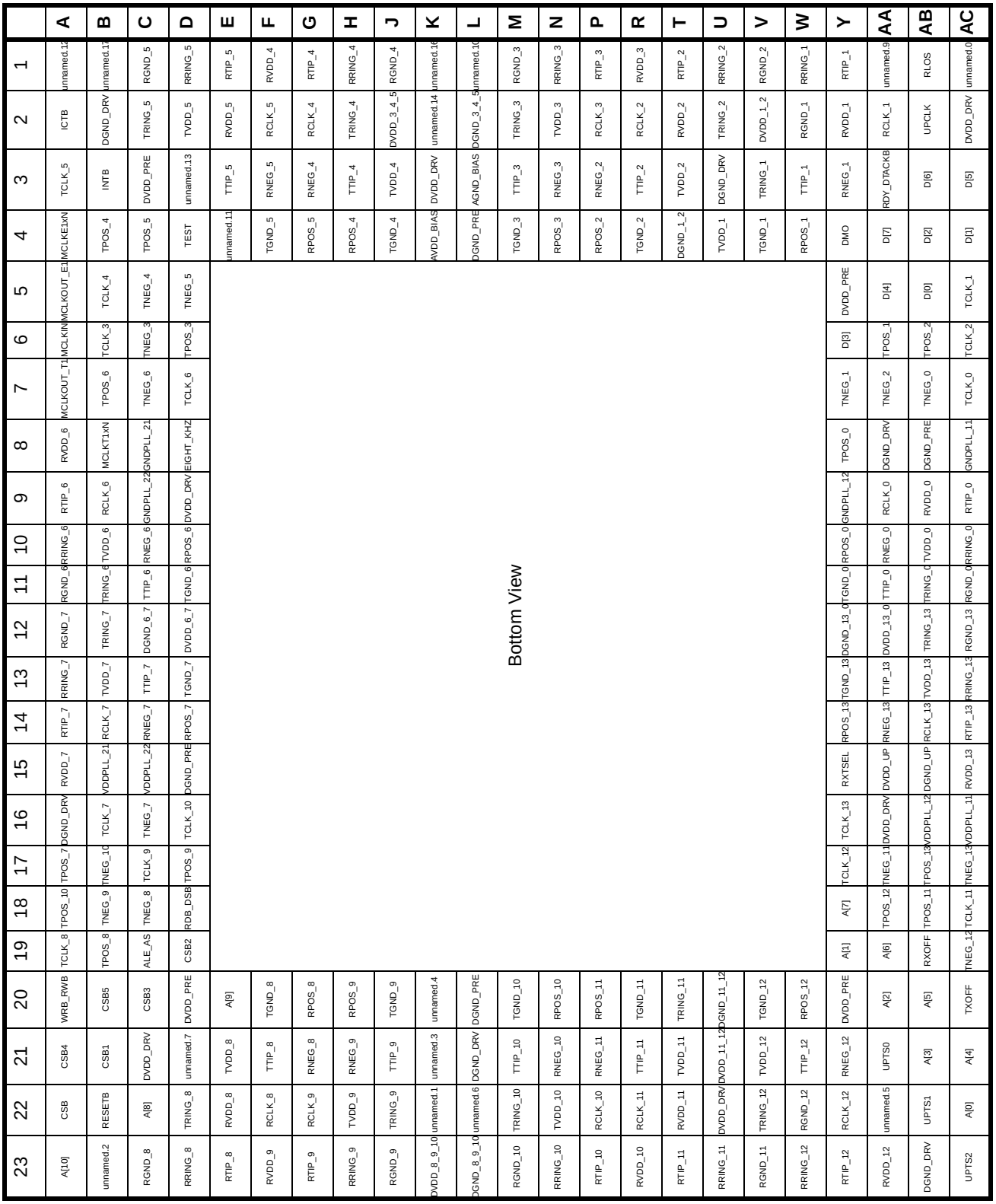
FEATURES

- Fully integrated 14-Channel short haul and long haul transceivers for T1/J1 (1.544MHz) and E1 (2.048MHz) applications.
- T1/E1/J1 short haul, long haul, and clock rate are per port selectable through software without changing components.
- Internal Impedance matching on both receive and transmit for 75Ω (E1), 100Ω (T1), 110Ω (J1), and 120Ω (E1) applications are per port selectable through software without changing components.
- Power down on a per channel basis with independent receive and transmit selection.
- Five pre-programmed transmit pulse settings for T1 short haul applications, as well as an arbitrary programmable waveform generator for custom transmit pulse shaping per channel.
- Arbitrary pulse generator for T1 short haul and T1 long haul modes per channel.
- Transmit line build outs (LBO) for T1 long haul applications from 0dB to -22.5dB in three -7.5dB steps on a per channel basis.
- On-Chip transmit short-circuit protection and limiting protects line drivers from damage on a per channel basis.
- Independent Crystal-Less digital jitter attenuators (JA) with 32-Bit or 64-Bit FIFO for the receive and transmit paths
- On-Chip frequency multiplier generates T1 or E1 master clocks from a variety of external clock sources (8, 16, 56, 64, 128, 256kHz and 1X, 2X, 4X, 8X T1 or E1)
- Driver failure monitor output (DMO) alerts of possible system or external component problems.
- Transmit outputs and receive inputs may be "High" impedance for protection or redundancy applications on a per channel basis.
- Support for automatic protection switching.
- 1:1 and 1+1 protection without relays.
- Selectable receiver sensitivity from 0 to 36dB cable loss in T1 @ 772kHz, and 0 to 43dB cable loss in E1 @ 1,024kHz.
- Receive monitor mode handles 0 to 29dB resistive attenuation (flat loss) along with 0 to 6dB cable loss for both T1 and E1.
- Receiver line attenuation indication output in 1dB steps.
- Loss of signal (RLOS) according to ITU-T G.775/ ETS300233 (E1) and ANSI T1.403 (T1/J1).
- Programmable receive slicer threshold (45%, 50%, 55%, or 68%) for improved receiver interference immunity.
- Programmable data stream muting upon RLOS detection.
- On-Chip HDB3/B8ZS encoder/decoder with an internal 16-bit LCV counter for each channel.
- On-Chip digital clock recovery circuit for high input jitter tolerance.
- QRSS pattern generator and detection for testing and monitoring.
- Error and bipolar violation insertion and detection.
- Transmit all ones (TAOS) and in-band network loop up and loop down code generation.
- Automatic loop code detection for remote loopback activation.
- Supports local analog, remote, digital, and dual loopback modes.
- Low Power dissipation: 170mW per channel (50% density).
- 250mW per channel maximum power dissipation (100% density).
- Single 3.3V supply operation (3V to 5V I/O tolerant).
- 304-Pin TBGA package
- -40°C to +85°C Temperature Range
- Supports gapped clocks for mapper/multiplexer applications.

PRODUCT ORDERING INFORMATION

PRODUCT NUMBER	PACKAGE TYPE	OPERATING TEMPERATURE RANGE
XRT83L314IB	304 Lead TBGA	-40°C to +85°C

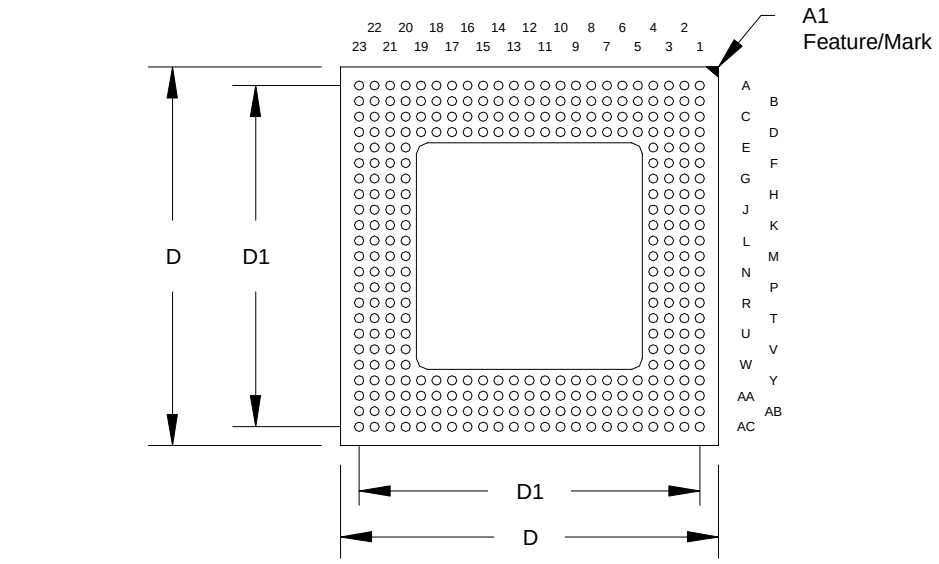
PIN OUT OF THE XRT83L314



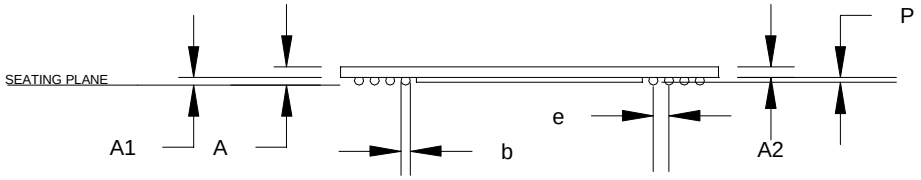
ORDERING INFORMATION

PRODUCT NUMBER	PACKAGE	OPERATING TEMPERATURE RANGE
XRT83L314IB	304 LEAD TBGA	-40^{0}C to +85^{0}C

PACKAGE DIMENSIONS (DIE DOWN)



(A1 corner feature is mfger option)



Note: The control dimension is in millimeter.

	INCHES		MILLIMETERS	
SYMBOL	MIN	MAX	MIN	MAX
A	0.051	0.067	1.30	1.70
A1	0.018	0.028	0.45	0.70
A2	0.031	0.071	0.80	1.80
P	0.004	0.012	0.10	0.30
D	1.213	1.228	30.80	31.20
D1	1.100 BSC		27.94 BSC	
b	0.024	0.035	0.60	0.90
e	0.050 BSC		1.27 BSC	

REVISION HISTORY

REVISION #	DATE	DESCRIPTION
P1.0.0	02/14/03	First release of the 14-Channel LIU Preliminary Datasheet
P1.0.1	03/27/03	Added the 16-bit LCV Counter Details for Revision B Silicon