

TP3410 ISDN Basic Access Echo-Cancelling 2B1Q U Transceiver

General Description

The TP3410 is a complete monolithic transceiver for ISDN Basic Access data transmission at either end of the U interface. Fully compatible with ANSI specification T1.601-1988, it is built on National's advanced 1.5 micron double-metal CMOS process, and requires only a single +5V power supply. A total of 160 kbps full-duplex transmission on a single twisted-pair is provided, with user-accessible channels including 2 'B' channels, each at 64 kbps, 1 'D' channel at 16 kbps, and an additional 4 kbps for loop maintenance. 12 kbps of bandwidth is reserved for framing. 2B1Q Line coding is used, in which pairs of binary bits are coded into 1 of 4 quantum levels for transmission at 80k symbols/sec (hence 2 Binary/1 Quaternary). To meet the very demanding specifications for <math>< 1 \text{ in } 10^6</math> Bit Error Rate even on long loops with crosstalk, the device includes 2 Adaptive Digital Signal Processors, 2 Digital Phase-locked Loops and a controller for automatic activation.

The digital interface on the device can be programmed for compatibility with either of two types of control interface for chip control and access to all spare bits. In one mode a Microwire serial control interface is used together with a 2B + D digital interface which is compatible with the Time-division Multiplexed format of PCM Combo devices and backplanes. This mode allows independent time-slot assignment for the 2 B channels and the D channel. Alternatively, the GCI (General Circuit Interface) may be selected, in which the 2B + D data is multiplexed together with control, spare bits and loop maintenance data on 4 pins.

Features

- 2 'B' + 'D' channel 160 kbps transceiver for LT and NT
- Meets ANSI T1.601-1988 U.S. Standard

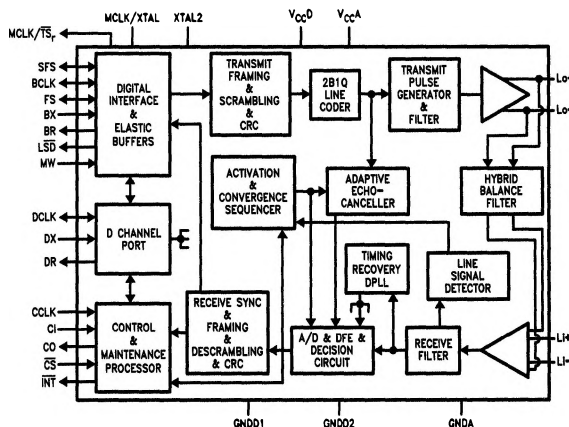
- 2B1Q line coding with scrambler/descrambler
- Range exceeds 18 kft bridge taps
- >70 dB adaptive echo-cancellation and equalization
- On-chip timing recovery, no precision external components
- Direct connection to small line transformer (27 mH)
- Automatic activation controller
- Selectable digital interface formats:
 - TDM with time-slot assigner plus MICROWIRE™ control
 - GCI (General Circuit Interface), or
 - IDL (Inter-chip Digital Link)
- Backplane clock DPPLL allows free-running XTAL
- Elastic data buffers meet Q.502 wander/jitter for Slave-slave mode on PBX Trunk Cards
- EOC and spare bits access with automatic validation
- 2 block error counters
- 6 loopback test modes
- Single +5V supply, 300 mW active power
- 5 mW idle mode with line signal detector

Applications

- LT, NT-1, NT-2 Trunks, U-TE's Regenerators etc.
- Easy Interface to:
 - Line Card Backplanes
 - "S" Interface Device
 - Codec/Filter Combos
 - LAPD Processor
 - HDLC Controller

TP3420
 TP3054/7 and TP3075/6
 HPC16400
 TP3451

Block Diagram



Note: Pin names show Microwire mode.

TL/H/9151-1