![National Semiconductor]

TP3420 ISDN Transceiver S/T Interface Device

General Description

The TP3420 S Interface Device (SID™) is a complete monolithic transceiver for data transmission on twisted pair subscriber loops. It is built on National's advanced 1.5 micron double-metal CMOS process, and requires only a single +5V supply. All functions specified in CCITT recommendation I.430 for ISDN basic access at the 'S' and 'T' interfaces are provided, and the device can be configured to operate either in a TE (Terminal Equipment), in an NT-1 or NT-2 (Network Termination) or as a PABX line-card or trunk-card device.

As specified in I.430, full-duplex transmission at 192 kb/s is provided on separate transmit and receive twisted wire pairs using inverted Alternate Mark Inversion (AMI) line coding. Various channels are combined to form the 192 kb/s aggregate rate, including 2 'B' channels, each of 64 kb/s, and 1 'D' channel at 16 kb/s. In addition, the TP3420 provides the 800 b/s "S1" & "Q" multiframe channels for Layer 1 maintenance.

All I.430 wiring configurations are supported by the TP3420 SID, including the "passive bus" for up to 8 TE's distributed within 200 meters of low capacitance cable, and point-to-point and point-to-star connections up to at least 1500 meters (24AWG). Adaptive receive signal processing enables the device to operate with low bit error rates on any of the standard types of cable pairs commonly found in premise wiring installations when tested with the noise sources specified in I.430.
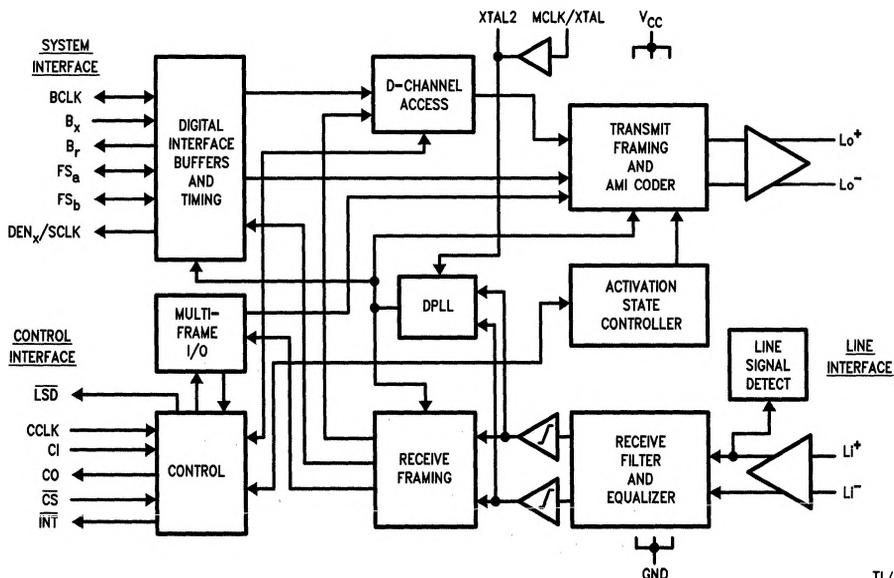
Features

- Single chip 4 wire 192 kb/s transceiver
- Provides all CCITT I.430 layer 1 functions
- Exceeds I.430 range: 1.5 km point-to-point
- Adaptive and fixed timing options for NT-1
- Clock resynchronizer and elastic buffers for NT-2/LT
- Slave-slave mode for NT-2 trunks
- Multiframe channel for layer 1 maintenance
- Selectable system interface formats
- MICROWIRE™ compatible serial control interface
- Single +5V supply
- 20-pin package

Applications

- Same Device for NT, TE and PBX Line Card
- Point-to-Point Range Extended to 1.5 km
- Point-to-Multipoint for all I.430 Configurations
- Easy Interface to:
  - LAPD Processor   HPC16400
  - Terminal Adapter   HPC16400
  - Codec/Filter COMBO™   TP3054/7 and TP3075/6
  - "U" Interface Device   TP3410
  - Line Card Backplanes—No External PLL Needed
- Line Monitor Mode for Test Equipment

Block Diagram

TL/H/9143–1