



T7531B/T7536 16-Channel Programmable Codec Chip Set

Features

- Single 5 V power supply operation
- Per-channel programmable transmit gain
— 19.4 dB range, better than 0.01 dB steps
- Per-channel programmable receive gain
— 25.4 dB range, better than 0.01 dB steps
- Per-channel programmable internal balance networks
- Programmable termination impedances
- Per-channel programmable μ -law, A-law, or linear PCM output
- Automatic gain calibration
- Advanced board- and self-test capability
- Programmable time-slot assignment with bit offset
- Data rate of 2.048 MHz or 4.096 MHz
- Differential transmit amplifiers
- Single-ended or differential receive amplifiers
- Analog and digital loopbacks
- Sigma-delta converters with dither noise reduction
- Serial microcontroller control interface
- JTAG test port

General Description

The T7531B is a custom, 16-channel line card signal processor which, together with a pair of custom T7536 octal A/D and D/A converters, comprises a low-cost, highly programmable voice codec that is compatible with all worldwide POTS lines.

Transmit and receive gains and hybrid balance coefficients are programmable per channel. Termination impedance is programmable per chip set. These functions, as well as time-slot assignment, calibration, and board test, are controlled via a microcontroller interface.

The DSP engine in the T7531B can be used to test the line card. When voice processing is not required, the spare processing time can be allocated on a per-line basis to a suite of user-controlled board-test routines. Providing intelligent board-test functionality at the line-card level frees the switch from having to perform test and error diagnosis tasks.

T7536 Description

Each of the T7536's eight channels consists of an antialias filter, sigma-delta A/D and D/A converters, reconstruction and smoothing filters, termination impedance synthesis, and selectable gain. The digital oversampled data is multiplexed onto a serial data port designed to interface with the T7531B. Another serial interface accepts control data from the T7531B for activating the various gain settings, self-test, and powerdown modes. This chip also contains a precision voltage reference. It is packaged in a 68-pin PLCC.

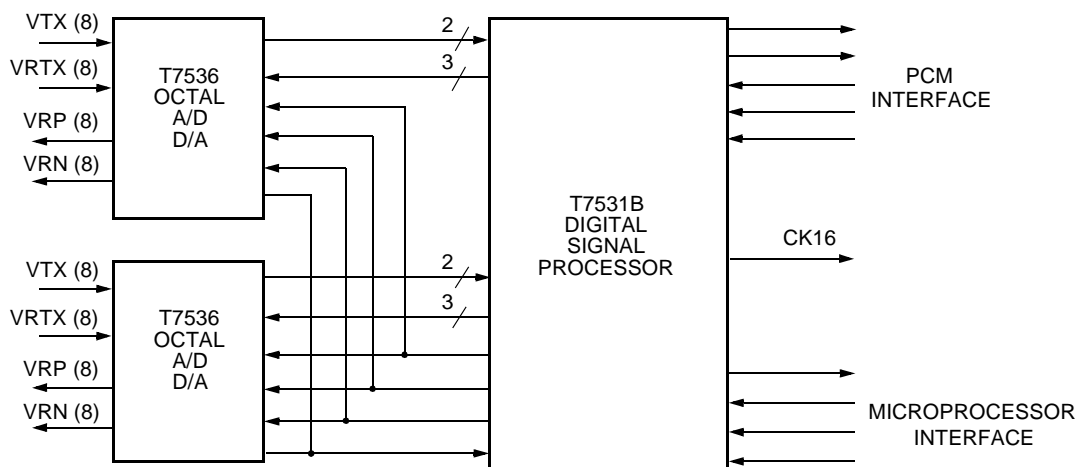
T7531B Description

The T7531B contains a digital signal processor (DSP) engine surrounded by a customized input/output frame. The I/O frame performs the μ -law or A-law conversion as well as the decimation and interpolation functions needed to interface the sigma-delta bit streams to the digital signal processor engine. The sigma-delta converters operate at a 1.024 MHz sample rate, while the signal processor operates at 16 ksamples/s. A key function of the I/O frame is to control the timing of the digital data going to the signal processor so that group delay is minimized.

The I/O frame also contains an integrated phase-locked loop which synthesizes all the required internal clocks for the chip set.

The microcontroller interface is used to download the gain and balance network settings, powerup/powerdown commands, time-slot assignments, digital loopback settings, and commands for the T7536 octal chips. This chip is packaged in a 68-pin PLCC.

System Block Diagram



5-3793.d (F)

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