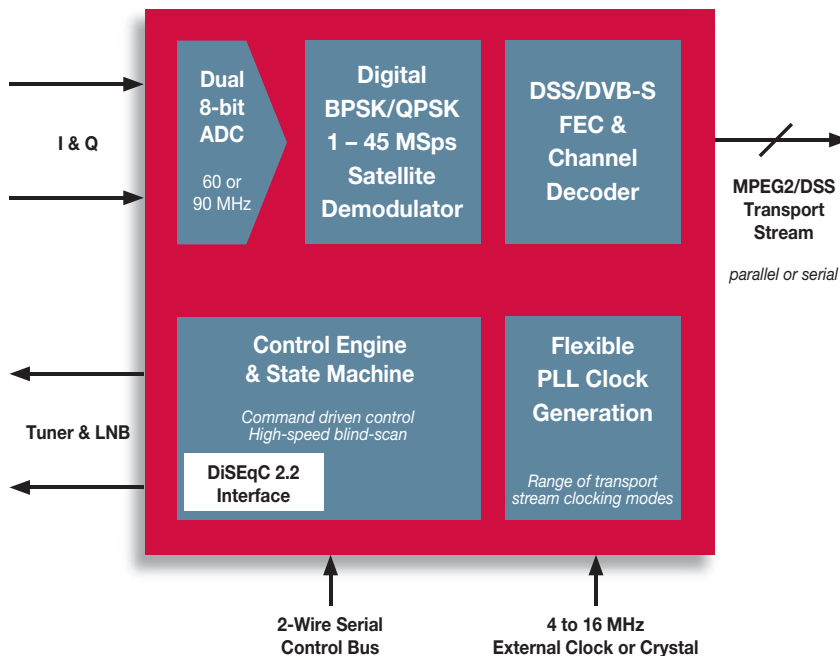


## PRODUCT PREVIEW

The ZL10313 demodulator chip and the ZL10036 tuner chip provide a complete motherboard-based RF subsystem for tuning, scanning and demodulating digital satellite TV signals. The integrated design is ideal for global STBs (set-top boxes), supporting “free-to-air” and subscriber-based digital satellite systems.

The ZL10313 is a QPSK/BPSK (quaternary phase shift keying/ bipolar phase shift keying) demodulator and channel decoder for digital satellite STBs. The device integrates an innovative state-machine controller with a dual ADC, demodulator, and high performance Viterbi and Reed/Solomon decoder, in a compact 7 x 7 mm package. Able to support high-level, command-driven software, the ZL10313 provides high speed 1 – 45 MSps scanning capability, simplifies programming, reduces software overhead on the processor, and optimizes the user interface. The ZL10313 range of clocks and flexible transport stream interfaces offer compatibility with a wide range of MPEG decoders.

**ZL10313 Simplified Block Diagram**



### Applications

- ➔ DVB and DSS STBs
- ➔ SMATV (single master antenna TV) trans-modulators
- ➔ Satellite PC applications

### Packaging and Availability

- ➔ ZL10313 64-pin LQFP
- ➔ ZL10036 40-pin QFN

### ZL10313 Satellite Demodulator

- ➔ High-speed auto-scan capability for blind frequency, symbol rate and code rate acquisition
- ➔ Low power consumption of 250 mW (typically) with ultra low-power standby mode
- ➔ On-chip Eutelsat's DiSEqC™ v2 receive/transmit for full control of LNB and dish
- ➔ Automatic IQ phase resolution
- ➔ Up to ±15 MHz LNB frequency tracking
- ➔ Flexible parallel and serial transport stream interfaces
- ➔ Pin compatible with the ZL10312 demodulator
- ➔ Available in tested die form

### Efficient Software Implementation

- ➔ Built-in automatic search and decode control
- ➔ State machine architecture allows high-level, command-driven software for simplified code development, minimizing software overhead and reducing development time

### Standards Compliant

- ➔ European Broadcast Union ETS 300421 specification for DVB-S
- ➔ DirecTV specification for DSS
- ➔ Sleep pin supports ENERGY STAR® requirements

### ZL10036 Digital Satellite Tuner

- ➔ Single chip L band to zero IF quadrature down converter compliant with DSS and 1 – 45 MSps DVB formats
- ➔ Integrates selectable RF loop-through, mixer LO and tuneable base band filters with bandwidth adjustment
- ➔ “Power and Forget” automatic VCO does not require calibration or alignment and is temperature compensated

# ZL10036/313 TUNER & DEMODULATOR

## APPLICATION

### ZLE10538 Satellite Receiver Front-end

As shown below, the ZL10313 demodulator and channel decoder can be coupled with the ZL10036 digital satellite tuner chip to provide an efficient system for tuning, scanning, decoding and demodulating digital satellite TV signals.

The ZL10036 is a highly integrated single-chip wideband QPSK direct conversion tuner with a selectable RF bypass for connecting to a second receiver module. It is a high-performance, alignment-free tuner solution, supporting symbol rates from 1 – 45 MSps. The ZL10036 reduces the bill of material while optimizing the performance of motherboard or “can” tuners.

After receiving the analog I and Q signals from the ZL10036 tuner, the ZL10313 digitizes and demodulates the signal and implements the complete DVB/DSS FEC (Forward Error Correction) and descrambling functions. Output from the ZL10313 is fed to the MPEG decoder in the form of MPEG2 or DSS transport stream data packets. The ZL10313 has a range of clock modes and transport stream interface options to give a fully flexible interface to MPEG decoder products.

The ZL10313 is designed to simplify code development and reduce overall software requirements. The on-chip state ma-

chine allows symbol rates, Viterbi code rates, and spectral inversion status to be programmed via easy-to-use high-level commands. This dramatically simplifies design compared to competitive devices, which require access to a large number of registers for programming. The serial two-wire control bus provides an interface to the host CPU.

The decoder minimizes software overhead on the CPU using built-in automatic search and control functions that allow scan routines with little intervention from the CPU. The ZL10313 provides high-speed 1 – 45 MSps auto-scan capability. The scanning mode for blind frequency, symbol rate and code rate acquisition enables STBs to efficiently scan the Astra high band (11.7 to 12.75 GHz) and the 20 – 30 MSps channels in 22 seconds for both polarization.

The ZL10313 together with the ZL10036 consumes less than 1.5 W of power. Both devices are equipped with a sleep pin enabling ~1000-fold reduction in power consumption during stand-by mode. This ultra low-current consumption improves overall reliability of the RF front-end and assists in compliance with ENERGY STAR® requirements.

