DIGITAL PLL
ZL30402

The ZL™30402 is a digital phase locked loop (DPLL) that synchronizes SONET (Synchronous Optical Network) and SDH (Synchronous Digital Hierarchy) network equipment. The device is fully compliant with the applicable requirements of SONET Stratum 3, SONET Minimum Clock and G.813 applications.

The integrated DPLL is a standard, IC-based solution that eliminates the requirements for external loop filter components and reduces board space, cost and complexity compared to traditional DSP-based or module solutions.

At a Glance

- **Package:** 80 pin LQFP (Pin compatible with MT90401)
- **Volume Production:** Now

Applications

- SONET/SDH Add/Drop Multiplexers
- SONET/SDH Uplinks
- Integrated Access Devices
- ATM Edge Switches

High Performance

- Holdover accuracy of 0.001 ppb (parts per billion) ensures synchronization when the timing source is down.
- Very low MTIE enables hitless reference switching even when switching between references with different frequencies.
- Automatic reference frequency detection.

Flexible for Multiple System Requirements

- Supports free-run, normal (locked) or holdover modes.
- Selectable loop filter corner frequency supports SONET or SDH operation.
- OC-3/STM-1, DS3, E3, 19.44MHz, DS2, E1, DS1, 8kHz and TDM bus clock outputs to 16.384MHz.
- Accepts reference inputs from two independent sources and synchronizes to any combination of 8kHz, 1.544MHz, 2.048MHz and19.44MHz.
- Programmable +/- phase adjustment of output clocks.

Simplifies Design

- Hardware or software control options.
- External oscillator enhances flexibility, offering the designer choice of size, source, quality and cost.

Standards Compliant

- Telcordia GR-253-CORE for SONET Stratum 3 and SONET Minimum Clock.
- Telcordia GR-1244-CORE for Stratum 3.
- ITU-T G.813 Option 1 and Option 2.

Customer Support

The ZL30402 is supported by a customer evaluation board as well as with extended in-house support.

Applications

SONET and SDH are standards for optical networks and are expected to provide the transport infrastructure for these worldwide networks for many years into the future. SONET and SDH are known for versatility, reliability and the ability to simultaneously support multiple forms of synchronous and asynchronous traffic.

Precise synchronization is key to the performance of SONET and SDH networks. To ensure optimal performance Telcordia and the ITU-T have defined SONET and SDH synchronization standards. These standards must be met in network element clocks to ensure precise synchronization with the master system reference clock for every system used to terminate a SONET/SDH payload, or multiplex and de-multiplex SONET/SDH traffic.

The ZL30402 was designed specifically to meet these stringent synchronization requirements making it ideal for use in SONET and SDH equipment clocks. It is highly flexible and meets a wide range of synchronization requirements including Telcordia's GR-1244-CORE for Stratum 3 clocks and GR-253-CORE for SONET Stratum 3 and SONET Minimum Clocks. For SDH equipment clocks, the device meets the ITU-T's G.813 for Option 1 and Option 2 clocks.

As shown in the diagram below, the ZL30402 is a DPLL that can be implemented at every node in the system where transmit data must be synchronized to a master system reference clock. The device uses an integrated approach that allows all Telcordia and ITU synchronization requirements to be met without the need for external loop filter components, and reducing cost, board space and complexity.

Paired with a 20MHz clock oscillator, the ZL30402 provides a complete SONET or SDH node clock that supports all of the long-term stability requirements for wander, phase transient control and holdover. With a holdover accuracy of 0.001ppb, the ZL30402 allows network equipment to continue to send and receive data even when the source of network synchronization is occasionally interrupted or changed.

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