

Features

- **Two Independent Channels**
- **Three Input Clocks Per Channel**
 - Three inputs, two differential/CMOS, one CMOS
 - Any input frequency from 1kHz to 1250MHz (1kHz to 300MHz for CMOS)
 - Inputs continually monitored for activity and frequency accuracy
 - Automatic or manual reference switching
- **Low-Bandwidth DPLL Per Channel**
 - Programmable bandwidth, 5Hz to 500Hz
 - Attenuates jitter up to several UI
 - Freerun or holdover on loss of all inputs
 - Hitless reference switching
 - High-resolution holdover averaging
 - Digitally controlled phase adjustment
- **Low-Jitter Fractional-N APLL and 3 Outputs Per Channel**
 - Any output frequency from <1Hz to 1035MHz
 - High-resolution fractional frequency conversion with 0ppm error
 - Easy-to-configure, encapsulated design requires no external VCXO or loop filter components
 - Each output has independent dividers
 - Output jitter is typically 0.16 to 0.28ps RMS (12kHz-20MHz integration band)

Ordering Information

ZL30182LFG7	64 Pin LGA	Trays
ZL30182LFF7	64 Pin LGA	Tape and Reel
Ni Au		
Package size: 5 x 10 mm		
-40°C to +85°C		

- Outputs are CML or 2xCMOS, can interface to LVDS, LVPECL, HSTL, SSTL and HCSL
- In 2xCMOS mode, the P and N pins can be different frequencies (e.g. 125MHz and 25MHz)
- Per-output supply pin with CMOS output voltages from 1.5V to 3.3V
- Precise output alignment circuitry and per-output phase adjustment
- Per-output enable/disable and glitchless start/stop (stop high or low)
- **General Features**
 - Automatic self-configuration at power-up from internal EEPROM; up to four configurations pin-selectable
 - Numerically controlled oscillator mode
 - Zero-delay mode with external feedback
 - SPI or I²C processor Interface
 - Easy-to-use evaluation software

Applications

- Telecom OTN and SONET/SDH/SyncE cards
- Frequency conversion and jitter attenuation in a wide variety of equipment types

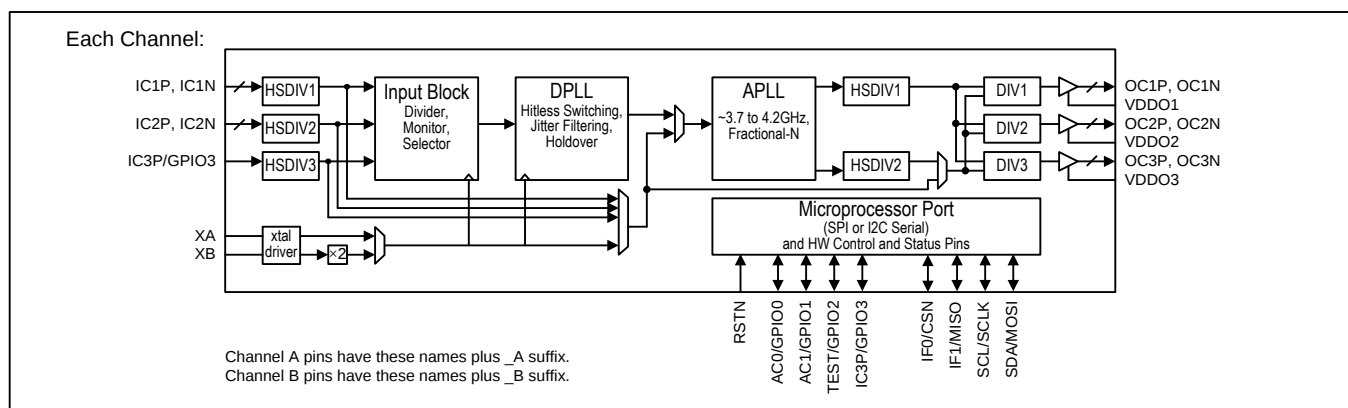


Figure 1 - Functional Block Diagram

1. Application Examples

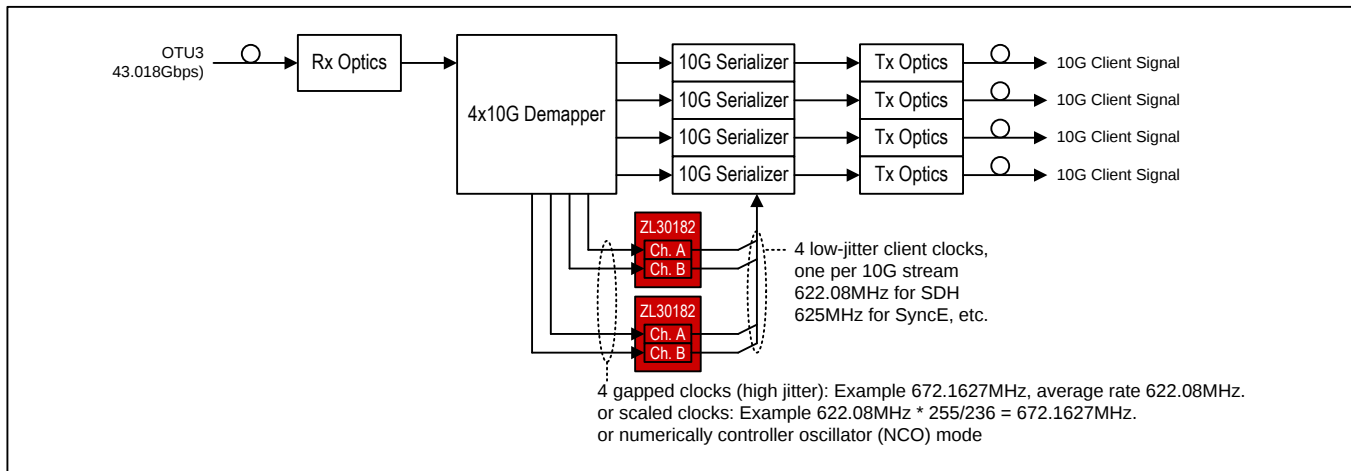


Figure 2 – OTU3 Demux/Demapper Clock Translation and/or Jitter Attenuation

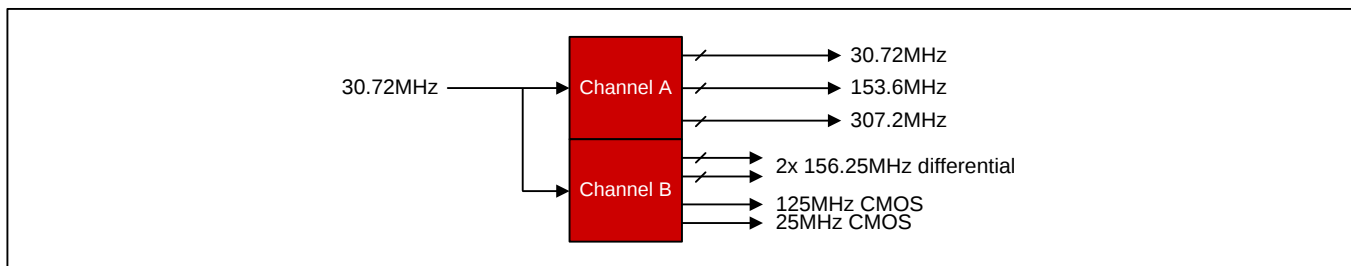


Figure 3 – Base Station Frequency Conversion with Jitter Attenuation

2. Detailed Features

2.1 Input Block Features

- Three input clocks per channel, two differential or single-ended, one single-ended
- Input clocks can be any frequency from 1kHz up to 1250MHz (differential) or 300MHz (single-ended)
- Supported telecom frequencies include PDH, SDH, Synchronous Ethernet, OTN, wireless
- Inputs constantly monitored by programmable activity monitors and frequency monitors
- Fast activity monitor can disqualify the input after a few missing clock cycles
- Frequency measurement and monitoring with 1ppm resolution and accept/reject hysteresis
- Optional input clock invalidation on GPIO assertion to react to LOS signals from PHYs

2.2 DPLL Features

- One DPLL per channel
- Very high-resolution DPLL architecture
- State machine automatically transitions between tracking and freerun/holdover states
- Revertive or nonrevertive reference selection algorithm
- Programmable bandwidth from 5Hz to 500Hz
- Less than 0.1dB gain peaking
- Programmable damping factor to balance lock time with peaking
- Programmable phase-slope limiting
- Programmable frequency rate-of-change limiting
- Programmable tracking range (i.e. hold-in range)
- Truly hitless reference switching with <200ps output clock phase transient
- Output phase adjustment in 10ps steps

- High-resolution frequency and phase measurement
- Fast detection of input clock failure and transition to holdover mode
- Holdover frequency averaging with programmable averaging time and delay time
- Better than 50ppb initial holdover accuracy

2.3 APLL Features

- APLL with very high-resolution fractional scaling (i.e. non-integer) per channel
- Any-to-any frequency conversion with 0ppm error
- Two high-speed dividers (integers 4 to 15, half divides 4.5 to 7.5)
- Easy-to-configure, completely encapsulated design requires no external VCXO or loop filter components
- Bypass mode supports system testing

2.4 Output Clock Features

- Three low-jitter output clocks per channel
- Each output can be one differential output or two CMOS outputs
- Output clocks can be any frequency from 1Hz to 1035MHz (250MHz max for CMOS and HSTL outputs)
- Output jitter is typically 0.16 to 0.28ps RMS (12kHz to 20MHz)
- In CMOS mode, an additional divider allows the OCxN pin to be an integer divisor of the OCxP pin (example: OC3P 125MHz, OC3N 25MHz)
- Outputs easily interface with CML, LVDS, LVPECL, HSTL, SSTL, HCSL and CMOS components
- Supported telecom frequencies include PDH, SDH, Synchronous Ethernet, OTN
- Can produce clock frequencies for microprocessors, ASICs, FPGAs and other components
- Can produce PCIe clocks (PCIe gen. 1, 2 and 3)
- Sophisticated output-to-output phase alignment
- Per-output phase adjustment with high resolution and unlimited range
- Per-output enable/disable
- Per-output glitchless start/stop (stop high or low)

2.5 General Features

- SPI or I²C serial microprocessor interface per channel
- Automatic self-configuration at power-up from internal EEPROM memory; pin control to specify one of four stored configurations
- Each channel can be configured for numerically controlled oscillator (NCO) mode, which allows system software to steer frequency with resolution better than 0.01ppb
- Zero-delay buffer configuration using an external feedback path
- Four general-purpose I/O pins per channel each with many possible status and control options
- Output frame sync signals
- Each channel's local oscillator can be fundamental-mode crystal or low-cost XO
- Internal compensation for local oscillator frequency error

2.6 Evaluation Software

- Simple, intuitive Windows-based graphical user interface
- Supports all device features and register fields
- Makes lab evaluation of the ZL30182 quick and easy
- Generates configuration scripts to be stored in internal EEPROM
- Generates full or partial configuration scripts to be run on a system processor
- Works with or without a ZL30182 evaluation board

3. Pin Diagram

The device is packaged in a 5x10mm 64-pin LGA.

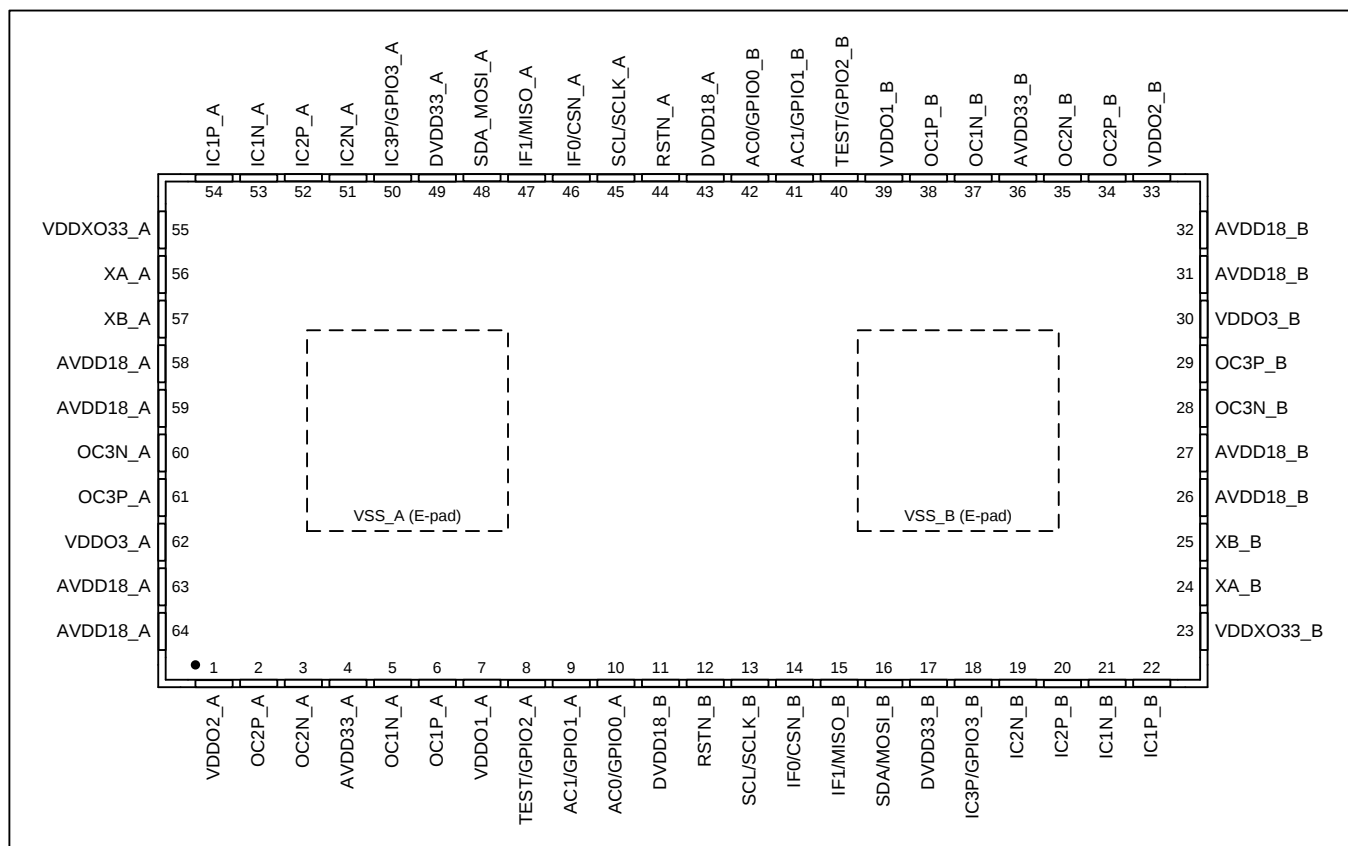
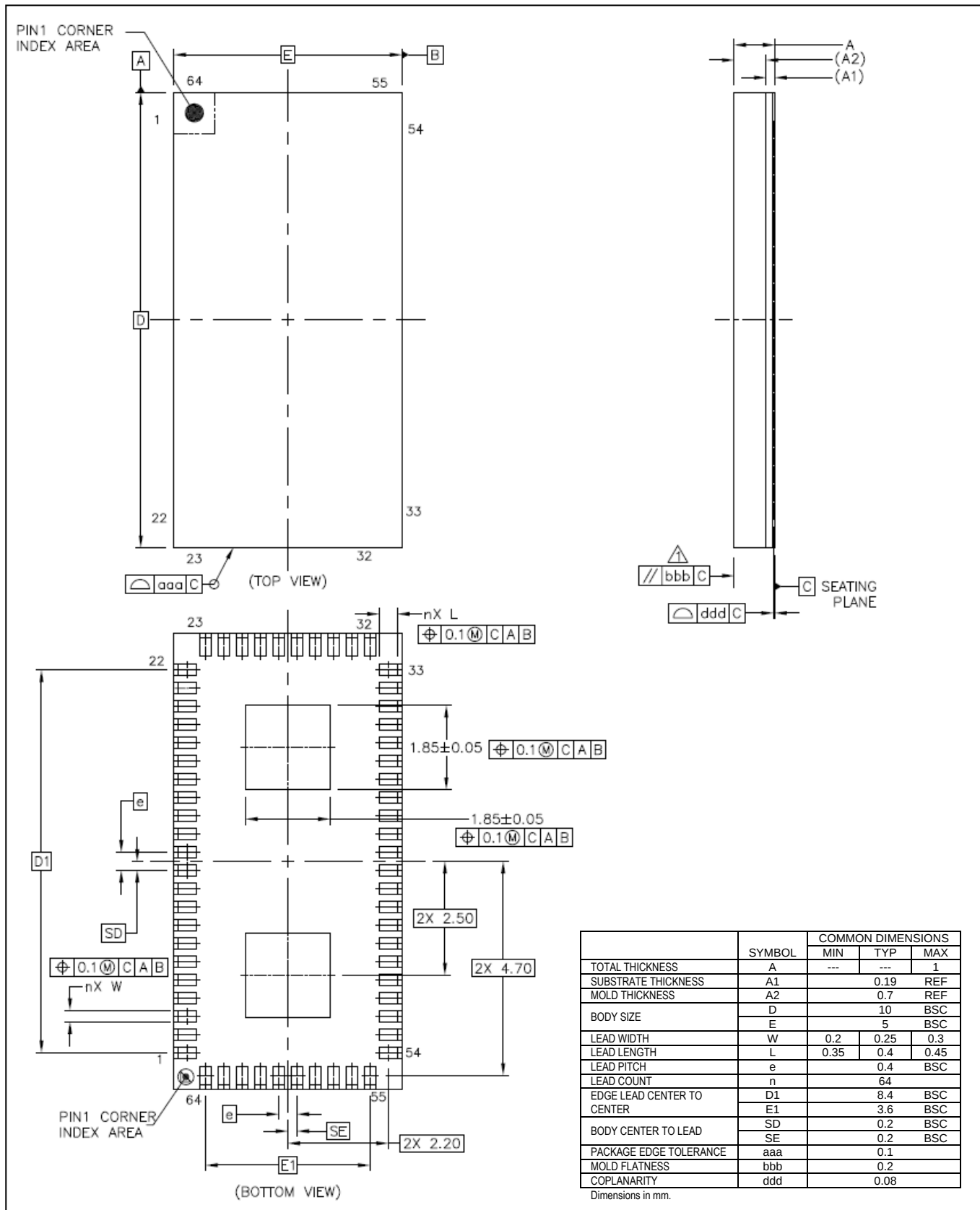


Figure 4 - Pin Diagram

4. Mechanical Drawing





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