

Features

- **Input clocks**
 - 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**
 - Programmable bandwidth, 14Hz to 500Hz
 - Attenuates jitter up to several UI
 - Free-run or digital hold on loss of all inputs
 - Digitally controlled phase adjustment
- **Low-jitter fractional-N APLL and 3 outputs**
 - 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)
 - 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)

Ordering Information

ZL30252LDG1	32 Pin QFN	Trays
ZL30252LDF1	32 Pin QFN	Tape and Reel
ZL30253LDG1	32 Pin QFN	Trays
ZL30253LDF1	32 Pin QFN	Tape and Reel

Matte Tin

Package size: 5 x 5 mm

-40°C to +85°C

- 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 external (ZL30252) or internal (ZL30253) EEPROM; up to four configs, pin-selectable
 - Numerically controlled oscillator mode
 - Spread-spectrum modulation mode
 - Zero-delay mode with external feedback
 - SPI or I²C processor Interface
 - Easy-to-use evaluation software

Applications

- Frequency conversion, jitter attenuation and frequency synthesis in a wide variety of equipment types

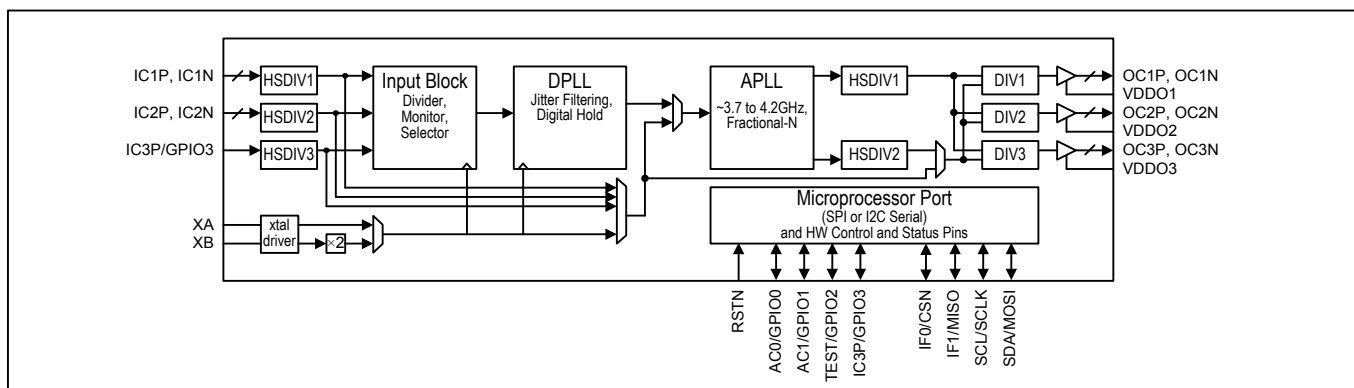


Figure 1 - Functional Block Diagram

1. Application Examples

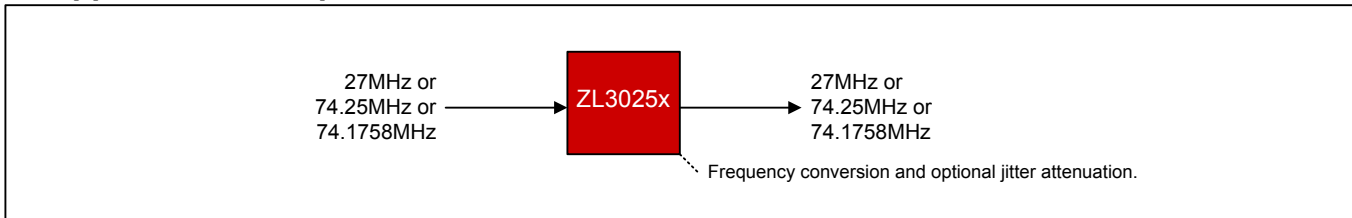


Figure 2 – Broadcast Video Frequency Conversion Application

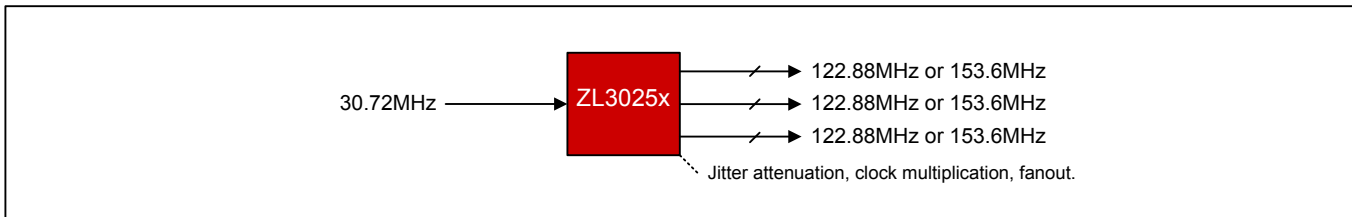


Figure 3 – Wireless Base Station Jitter Filtering and Frequency Conversion Application

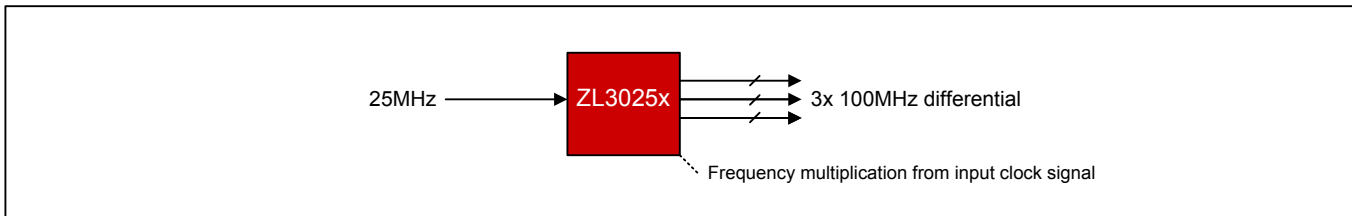


Figure 4 - PCI Express Frequency Multiplication Application

2. Detailed Features

2.1 Input Block Features

- Three input clocks: two differential or single-ended, one single-ended
- Input clocks can be any frequency from 1kHz up to 1250MHz (differential) or 300MHz (single-ended)
- Inputs constantly monitored by programmable activity monitors and frequency monitors
- Fast activity monitor can disqualify the selected reference after a few missing clock cycles
- Frequency measurement and monitoring with 1% resolution
- Optional input clock invalidation on GPIO assertion to react to LOS signals from PHYs

2.2 DPLL Features

- Very high-resolution DPLL architecture
- State machine automatically transitions between tracking and freerun/digital-hold states
- Revertive or nonrevertive reference selection algorithm
- Programmable bandwidth from 14Hz to 500Hz
- Programmable tracking range (i.e. hold-in range)
- Output phase adjustment in 10ps steps
- High-resolution frequency and phase measurement
- Fast detection of input clock failure and transition to digital hold

2.3 APLL Features

- Very high-resolution fractional scaling (i.e. non-integer multiplication)
- 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
- 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 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
- Automatic self-configuration at power-up from external (ZL30252) or internal (ZL30253) EEPROM memory; pin control to specify one of four stored configurations
- Numerically controlled oscillator (NCO) mode allows system software to steer DPLL frequency with resolution better than 0.01ppb
- Spread-spectrum modulation mode (meets PCI Express requirements)
- Zero-delay buffer configuration using an external feedback path
- Four general-purpose I/O pins each with many possible status and control options
- Can operate as DPLL+APLL for jitter filtering and low bandwidth or as APLL only
- 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 ZL30252 or ZL30253 quick and easy
- Generates configuration scripts to be stored in external (ZL30252) or internal (ZL30253) EEPROM
- Generates full or partial configuration scripts to be run on a system processor
- Works with or without a ZL30252 or ZL30253 evaluation board



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