# Quartz Crystal Phase-Locked Loop (QPLL)

Description:

The QPLL is a Quartz crystal based Phase-Locked Loop. Its function is to act as a jitter-filter for clock signals operating at the LHC clock frequency.

Depending on the operation mode, it provides three LVDS clock outputs at frequencies 160 MHz, 80 MHz and 40 MHz or 120 MHz, 60 MHz and 40MHz. The three outputs are synchronous with the input clock reference.
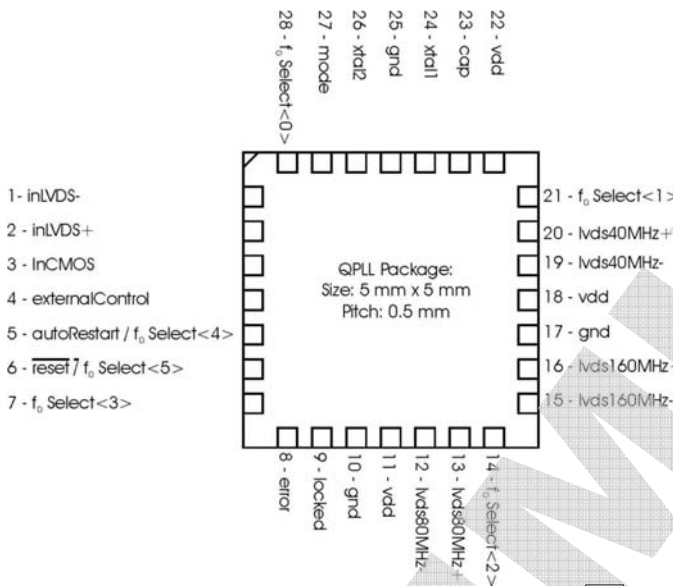
Features:

- Quartz crystal based PLL

- Operation frequency: f(LHC) = 40.0786 MHz

- Two frequency multiplication modes:

  - ×4, ×2 and ×1

  - ×3, ×1.5 and ×1

- Locking range: $\Delta \approx \pm 4$ KHz

- Loop bandwidth: < 7 KHz

- Output jitter: < 50 ps peak-to-peak for input signal jitter less than 120 ps RMS.

- Power supply voltage: 2.5V

- Power consumption: 100 mW

- Reference clock inputs:

  - LVDS

  - Single-ended 5V compatible

- Three LVDS clock outputs

- Package: LPCC-28 (5 mm x 5 mm, 0.5 mm pitch)

- Radiation tolerant

- 0.25 μm CMOS technology

- Crystal: The QPLL will be provided together with a Quartz crystal for operation at the specified frequency.

Pinout: