



VIA VL812 - SuperSpeed USB 3.0 Hub Controller

The VIA Labs VL812 4-port USB 3.0 hub controller is a third-generation fully-integrated single-chip solution which emphasizes low-power design and an industry-first integrated 5V DC-DC switching regulator. VL812 offers high performance, high power efficiency, and reduced overall system BOM, making it an ideal choice for mobile and other low-power applications.

The VIA Labs VL812 hub controller supports the higher transfer rates of the USB 3.0 specification, allowing maximum data transfer rates of up to 5Gbps, or ten times the throughput available to USB 2.0. In addition to rapid transfers, the VIA Labs VL812 integrates battery charging controller logic, enabling Dedicated Charging Port (DCP) and Charging Downstream Port (CDP) functionality as described in the USB Battery Charging 1.2 specification, as well as a charging in sleep mode feature that supports special vendor modes. When a USB Battery Charging-compatible device is attached, the device can charge over 3 times faster than conventional hubs or hosts. CDP mode allows users to transfer data while simultaneously charging their device at the same rate as when charging from an AC adapter.

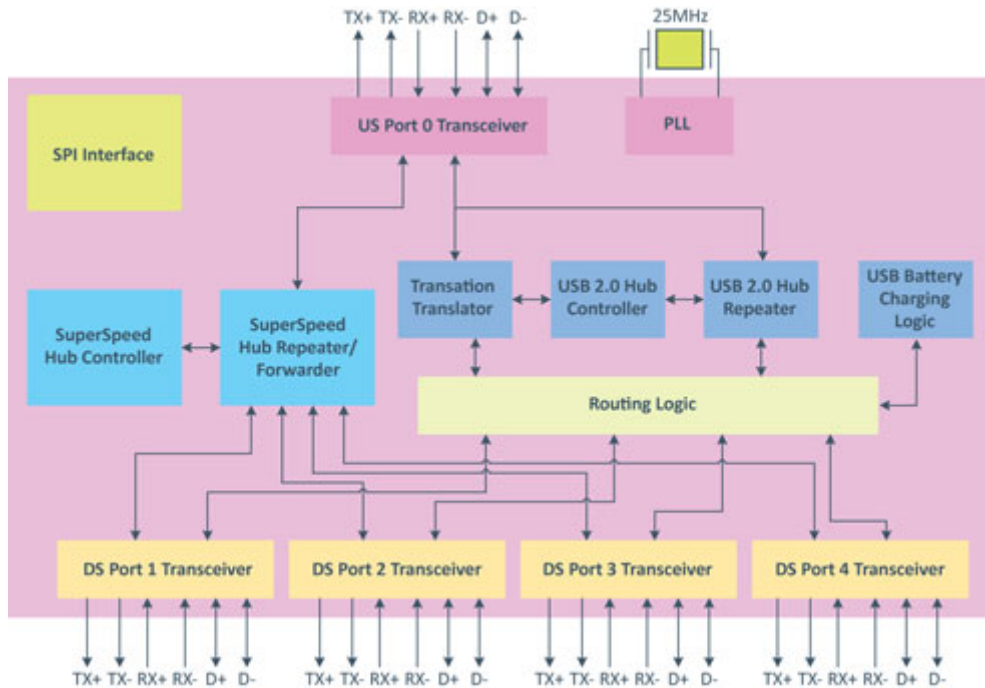
The VIA VL812 enables four USB devices to be connected to a single downstream port on the host computer or another hub. Employing an advanced CMOS process, its integrated in-house USB PHY enables one upstream port and four downstream ports support SuperSpeed transfer, but are also backwards compatible with previous USB specifications and offer support for Hi-Speed (480Mbps), Full-Speed (12Mbps), and Low-Speed (1.5Mbps) traffic. The VIA Labs in-house USB PHY also features adaptive equalization, allowing for industry-leading signal-integrity over a variety of topologies and channel conditions.

Employing a well planned pin-out and advanced manufacturing process, devices based on the VIA VL812 can enjoy easy layout and a low working temperature in the most compact device housing. Full sideband signal pins are available for showing power enable, over current, and LED status control. The SPI interface supports external Flash for firmware upgrades or additional software enhancements. The VIA VL812 is available in a QFN-76L green package (9x9x0.85 mm) to fit small form-factor designs.

VIA VL812-based hub devices enjoy full and comprehensive driver support on all modern operating systems including Windows 7, OSX, and Linux, making the VL812 well suited for stand alone USB hubs, desktop PC front panel hubs, on-board hubs, docking systems, and USB hub compound devices including mouse, keyboard, display and printer USB devices.



Block Diagram



Key Features

- Compliant to USB 3.0 specification revision 1.0, and USB specification revision 2.0
- Fully integrated single chip implementation
- Industry-first integrated 5V DC-DC switching regulator
- One up-stream supports Super-speed, high-speed and full-speed traffic
- Four down-stream ports support Super-speed, high-speed, full-speed and low-speed traffic
- "Charging Downstream Port", CDP, feature for rapid-charging
- In-house USB PHY employs advanced CMOS process for low power consumption
- Supports USB 3.0 low power states
- Supports full sideband signal functions inc. gang mode and LED status lights
- Full software support for Windows 7, Vista, XP, 2003, 2000, ME and Mac OS 10X and various Linux kernels