

## **VL811+**

# **Super-Speed USB Hub Controller**

Version: OLS 1.02

## **VL811+ System Overview**

VIA Lab's VL811+ is an advanced 4-port USB 3.0 Hub controller featuring low power consumption and comprehensive USB Charging support without the need for external charger ICs. The VL811+ hub has been USB-IF certified and has passed Microsoft WHCK testing for both Windows 8 and Windows RT. The custom in-house USB PHY employs an advanced CMOS process and supports USB power management, allowing for improved power-efficient operation, and gives VL811+ excellent signal integrity characteristics and improved backwards compatibility. VL811+ also features a flexible firmware architecture, providing a framework for custom functions as well as advanced feature support and in-field updates.

VL811+ based hub devices work under Windows 8, 7, Vista, XP, 2003/2000/ME, Mac OS X and various Linux kernels without additional drivers. Since USB 3.0 hubs do not require additional drivers, VL811+ is also compatible with non-x86 devices and platforms that support USB hub functions such as smartphones, tablets, and set-top boxes. VL811+ is well suited for all USB hub applications, and has been optimized for low-power applications such as docking stations/port replicators, motherboard onboard hubs, and USB Compound Devices. VL811+ can also be used in USB charging applications as well as the stand-alone USB hub market.

With well-planned pinout and a high level of integration, VL811+ based devices enjoy easy layout and simplified BOM. Full sideband signal pins are available for showing power enable, over current, GPIO, and LED status control. The SPI interface supports external EEPROM/Flash ROM which can be updated over USB. VL811+ is available in QFN 88L green package (10x10x0.85 mm) and is pin-compatible with VL810/VL811.

## Product Features / QFN-88

### USB 3.0 Compliant

- Compliant to Universal Serial Bus 3.0 Specification Rev 1.0, including Hub errata
- Compliant to Universal Serial Bus Specification Revision 2.0
- Supports simultaneous Super-speed(SS), high-speed (HS), full-speed (FS) traffic, and low-speed (LS) traffic
- Four down-stream ports, one up-stream port
- In-house USB PHY employs advanced CMOS process for low power consumption
- Supports USB Low-Power States such as Ux states and Selective Suspend

### Full Sideband Signal Support

- Supports either individual mode or gang mode operation for power enable & over current on down-stream ports
- Supports Dual LED status indicators with control via GPIO per down-stream port (Typically Green & Amber)
- 2x GPIO, reserved for special functions

### Comprehensive USB Battery Charging Support

- Supports USB Battery Charging Specification v1.2 (SDP, CDP, DCP)
- Adds Support for Vendor Specific Charging Modes eg. Apple, RIM, etc.
- Supports YD/T 1591-2009
- Supports "Sleep Charging" (DCP + Apple Mode)
- Support charging across all down-stream ports, depending on configuration

### Physical

- QFN 88L green package (10x10x0.85 mm)
- Pin-to-Pin compatible with VL810, VL811

### Certification

- Earned USB 2.0 USB-IF certification
- Earned USB 3.0 USB-IF certification
- Passed WHCK testing and is certified Windows 8/Windows RT Compatible
- Passed EuP/ErP 2013 & Energy Star 6.0 Tests

### Applications

- Standalone USB hub
- Desktop/Notebook motherboard on-board hub
- Desktop front panel hub
- Notebook/Ultrabook Docking Station / Port Replicator
- USB hub compound device with keyboard, mouse, display, etc.

### Platform and Operating System Support

- General support across all major OS and platforms that offer USB such as PC, MAC, Linux, etc.
- FW Update over USB
- USB hub function is dependent upon the USB Host Controller
- No proprietary driver needed, even for Battery Charging Function

### Misc

- Optimized for Low Power consumption
- 3.3 V and 1.15 V power supply
- PLL embedded with external 25MHz crystal
- Support external SPI flash for firmware upgrade

## VL811+ Block Diagram

