



VL820

USB 3.1 Gen 2 Hub Controller

Version: OLS 1.02

VL820 System Overview

VIA Lab's VL820 is the world's first USB 3.1 Gen 2 Hub Controller featuring highly-integrated, application specific design. VL820 features 1x upstream port and 4x downstream ports, all of which support 10Gbps USB 3.1 Gen 2 operation. The downstream ports can support any combination of SuperSpeed Plus (10Gbps), SuperSpeed (5Gbps), High Speed (480Mbps), Full Speed (12Mbps), and Low Speed (1.5Mbps) devices. VL820's integrated USB 2.0 hub features Multiple Transaction Translators, providing increased bandwidth and performance when multiple Full Speed devices are simultaneously used.

VL820 features an optionally configurable USB Billboard Device when used in USB-PD Alternate Mode applications, and an optionally configurable USB HID endpoint to support Media Control Buttons such as Play/Pause, Volume Up/Down, etc. VL820 also features an optionally configurable USB Charging Controller for charging various devices such as smartphones and tablets that can be configured on a per-pert basis.

VL820 features a flexible firmware architecture, providing a framework for custom functions in addition to in-field updates. Various parameters including USB configuration, Tx equalization setting, and GPIO behavior are changeable via firmware. VL820 also features an optionally configurable USB Charging Controller for charging various devices such as smartphones and tablets that can be configured on a per-pert basis.



Product Features/ QFN-76

USB 3.1 Compliant

- Compliant to Universal Serial Bus 3.1 Specification
 - SuperSpeed Plus USB (USB 3.1 Gen 2)
- Compliant to Universal Serial Bus 2.0 Specification
 - USB 2.0 Hub Supports MTT
- Supports Simultaneous Operation of Any Combination of SuperSpeed Plus, SuperSpeed, High-Speed, Full-Speed, and Low-Speed Devices
- Supports USB Power Saving Features such as Link Power Management, Ux States, Selective Suspend, and Function Suspend
- In-house USB PHY employs advanced CMOS process for low power consumption

Certification

- Earned USB 3.1 Gen2 USB-IF certification TID# 5030000002

Integrated USB Devices

- USB Billboard Class 1.21 Device
 - Implemented as a USB 2.0 Virtual Device
 - Configurable Behavior – Expose When Necessary / Always Present / Disabled
- USB HID Class Device
 - Implemented as a USB 2.0 Virtual Device, Facilitates FW Update or Media Control Buttons
 - Configurable Behavior – Always Present / Disabled

Full Sideband Signal Support

- Supports Any Combination of Individual or Ganged Mode Over-Current for All Ports
- Supports PWM LED Status Lights
- SPI Interface for Firmware.
- Firmware Upgradable over USB

Comprehensive USB Battery Charging Support

- Supports USB Battery Charging Specification v1.2 (SDP, CDP, DCP)
- Support for Vendor Specific Charging Modes eg. Apple 2.4A, Samsung, etc.
- Supports YD/T 1591-2009
- Supports Stand-Alone Charging when System is Suspend, Shut Down, or Disconnected
- Any Combination of DFPs can be Configured to Support USB Battery Charging

Power and Package

- Requires 3.3V and 1.05V Inputs
- 25MHz Xtal



VL820 Block Diagram

