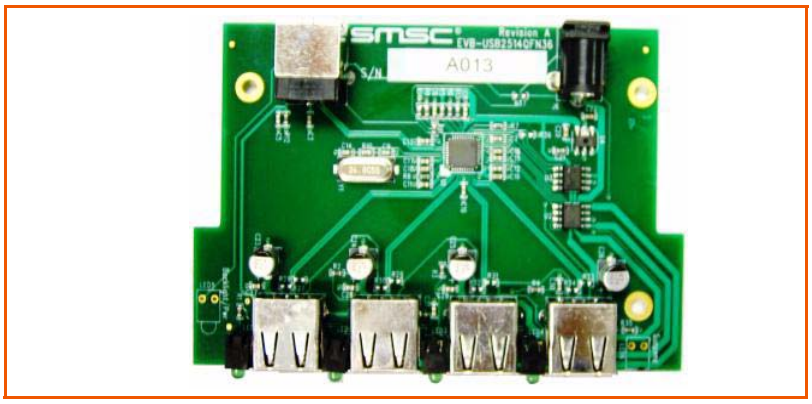
EVB-USB2514Q36-BAS 36-Pin QFN Evaluation Board



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1 Overview

The SMSC USB2514 MultiTRAK™ is a Low-Power Full-Featured High-Speed USB2.0 compliant hub with four down-stream ports. The EVB-USB2514Q36-BAS Evaluation Board demonstrates a stand alone application for the hub with all the features listed below and demonstrates the advanced power saving options and configurable port assignments.

1.1 Features

- Operates from a single voltage (+5.0V, regulated) 'wall wart' external power supply with LED indication.
- Low Cost 2-Layer Design.
- USB2514 36 - pin QFN package low pin count.
- High-Speed (480Mbits/s), Full-Speed (12Mbits/s), and Low-Speed (1.5Mbits/s) compatible.
- Optional pull-up resistors for disabling individual downstream ports.
- Self-powered operation.
- Single TT (capable) or Multi-TT enabled (default).
- Supports internal default hub configuration.
- Single Onboard +3.3V Regulator.
- Single Crystal Clock Source.
- Individual port over-current sensing.
- Individual port power control.
- Port OCS/Port Power Control interface with optional LEDs for port power indication.
- Optional ESD and EMI footprints are provided.

1.2 General Description

The EVB-USB2514Q36-BAS is a demonstration and low-cost evaluation platform featuring the USB2514 MultiTRAK™ 4-port, Low-Power High-Speed USB2.0 Hub. It is designed to robustly demonstrate the unique features of this device using a low-cost PCB implementation with individual port power control. The EVB-USB2514 is designed for low cost, power efficient implementation of a High speed USB Hub with minimal bill of materials. Schematics, Layout, and Bill of Materials are included minimizing the customers new product development time.

2 Hardware Configuration

2.1 Hardware Description

The EVB-USB2514Q36-BAS has one on board regulator, which generates 3.3V from 5V power supply. The USB2514 generates is own on chip 1.8V supply. The USB2514 Hub consumes power from the 3.3V supply while the MIC2026 Power distribution switch consumes power from the 5V supply. The MIC2026 Power distribution switch supplies downstream power to each attached device.

2.1.1 Port Assignment

Down-stream ports are numbered 1 through 4 with individual port power controllers. The power port controllers provide power to the downstream devices and over-current protection to the Hub from devices connected to ports 1-4. The dual-channel power distribution switches are for power distribution and circuit protection to the downstream ports. They are internally current limited and have "smart" thermal shutdown that protects the device and the load. The circuit reduces current consumption in fault modes. Upstream and downstream port connector circuits are designed for USB 2.0 compliance with decoupling, filtering, grounding and optional EMI/ESD circuitry. Optional pull-up resistors can be placed to disable a USB port, see schematic for implementation.

2.1.2 HUB Configuration

The EVB-USB2514Q36-BAS has been configured to support internal default configuration with strapping options enabled as determined by the state of CFG_SEL1 CFG_SEL0 pins immediately after reset. The internal 1.8V regulator supplies voltage to the oscillator and PLL is turned off during suspend to minimize suspend current.

2.1.3 Port Power LEDs (Optional)

LEDs 1-4 can be placed to indicate when port power is available. This feature is optional and consumes power in suspend mode. The recommendation is to leave unpopulated for low cost and low power implementations.

2.1.4 Connector Description

The EVB-USB2514Q36-BAS has a standard set of USB style connectors, one of type B for upstream ports and four of type A for downstream ports. Power is supplied via a 2.0 mm power jack. Table 1 lists all the connectors. For more details on the pinout of the connectors please see the schematic.

Table 1 Connector Description

CONNECTOR	TYPE	DESCRIPTION
J5	USB B	Upstream Port
J1	USB A	Downstream Port 1
J2	USB A	Downstream Port 2
J3	USB A	Downstream Port 3
J4	USB A	Downstream Port 4
J6	Power Jack 2.0mm	+5V Power Supply

2.1.5 Layout Considerations

The EVB-USB2514Q36-BAS is a Low-Power High-Speed USB2.0 compliant hub on two PCB layers. All signals are routed on the top layer demonstrating the simplicity of implementation. Differential

signals from the USB2514 match the upstream and downstream port placement, simplifying routing of critical signals.

Figure 2.1 Figure 2. EVB_USB2514-36 pin TOP LAYER