FE1.1s USB 2.0 High Speed 4-Port Hub Controller - Rev. B

Introduction

The Terminus FE1.1s is an USB 2.0 High Speed 4-port hub controller with special features to support GSMA „Universal Charging Solution", (UCS). It is fully compliant to USB-IF „Universal Serial Bus Specification Revision 2.0" and „Battery Charging Specification Revision 1.1".

The FE1.1s is a highly integrated, high quality, and high performance solution for USB 2.0 4-port hub. With its tiny footprint and extremely low power consumption, it is the best choice for embedded application as well as standalone hub.

The high quality of FE1.1s is guaranteed by Design-For-Testing with comprehensive scan chains and Built-In-Self Test modes which could exercise all High, Full and Low Speed analog front end (AFE) components on the packaging and testing stages.

FE 1.1s   Rev. 1.1

USB 2.0 High Speed 4-Port Hub Controller

FE1.1s could be optionally configured to support Charging Downstream Ports as defined by USB-IF Battery Charging Specification. With this feature enabled, an USB hub could be easily transformed into a charging station - USB Charging Hub for Universal Charging Solution compliant battery based portable devices.

Features

- Fully compliant with Universal Serial Bus Specification Revision 2.0 (USB 2.0);
  - Upstream Facing Port supports High-Speed (480MHz) and Full-Speed (12MHz) modes;
  - 4 Downstream Facing Ports support High-Speed (480MHz), Full-Speed (12MHz), and Low-Speed (1.5MHz) modes;

- Compliant with Universal Charging Solution, and USB Battery Charging Specification 1.1

- Integrated USB 2.0 Transceivers;

- Integrated upstream 1.5KΩ pull-up, downstream 15KΩ pull-down, and serial resisters

- Integrated 5V to 3.3V and 1.8V regulators;

- Integrated Power-On-Reset with power failure detection circuit;

- Integrated 12MHz Oscillator with feedback resister and crystal load capacitors;

- Integrated 12MHz-to-480MHz Phase Lock Loop (PLL);

- Integrated Portable Device detection circuitry for UCS supporting;

- Single Transaction Translator (STT)
  - One TT for all downstream ports
  - The TT could handle 64 periodic Start-Split transactions, 32 periodic Complete-Split transactions, and 6 none-periodic transactions;

- Ganged Power Control and Global Over-Current Detection support;

- EEPROM configured options –
  - Vendor ID, Product ID, & Device Release Number; and
  - Number of Downstream Ports;

- Automatic re-enumeration when hub switches from self-powered mode to bus-powered mode;

- Board configured comprehensive Port Indicators support:
  - Four Downstream Port Enabled indicator LED (Green, one for each port), plus one Active/ Suspend indicator LED (Red); or
  - One joint Downstream Port Enabled indicator LED (Green, one for all ports), plus one Active/Suspend indicator LED (Red); or
  - One joint Downstream Port Enabled indicator LED (Green, one for all ports), plus one Charging Request/Portable Device Detection indicator LED (Blue)

- Board configure support of portable device detection mechanism for Universal Charging Solution on all 4 downstream ports.

Package

- 28-Pin SSOP □ Body Size: 10mm x 4mm Packing Unit 10k
- 24-Pin QFN □ Body Size: 4mm x 4mm Packing Unit 3k

Introduction

The Terminus FE4.1 is an USB 2.0 High-Speed Dual-Port hub with special features to support USB dongle type of applications - which are compound devices with either two embedded devices, or one embedded device plus one open downstream port. It is fully compliant to USB-IF „Universal Serial Bus Specification Rev. 2.0".

To fit into such a tight and closed environment as the USB dongle type of applications, the FE4.1 features tiny footprint and extreme low power consumption. And to further reduce the component count, the FE4.1 provides TWO clock outputs - one of 12 MHz and one of 24 MHz for its downstream devices as clock source.

FE 4.1

USB 2.0 High Speed Dual Port Hub Controller
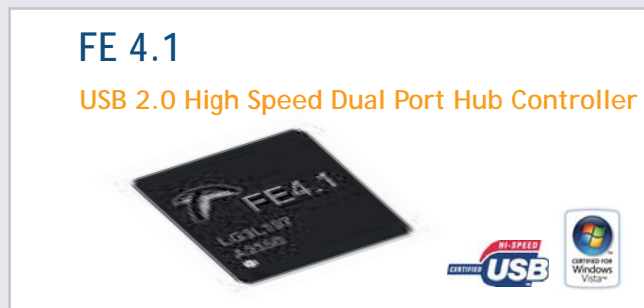
As all other hub controller series products from Terminus, the high quality of FE 4.1 is guaranteed by Design-For-Testing with comprehensive scan chains and Built-In-Self-Test modes which could exercise all High-, Full- and Low-Speed Analog Front End (AFE) components during the packaging and testing stages.

Package

20-Pin WQFN

□ Body Size: 4mm x 4mm
□ Packing unit: 3k

Features

- Fully compliant with Universal Serial Bus Specification Revision 2.0 (USB 2.0);

  - Upstream Facing Port supports High-Speed (480MHz) and Full-Speed (12MHz) modes;
  - 2 Downstream Facing Ports support High-Speed (480MHz), Full-Speed (12MHz), and Low-Speed (1.5MHz) modes;

- Integrated USB 2.0 Transceivers;

- Integrated upstream 1.5KΩ pull-up, downstream 15KΩ pull- down, and serial resisters;

- Integrated 5V to 3.3V and 1.8V regulators

- Integrated Power-On-Reset power failure detection circuit

- Integrated 12MHz Oscillator with feedback resister, and crystal load capacitator

- Integrated 12MHz-to-480MHz Phase LockLoop (PLL)

- Single Transaction Translator (STT)

  - One TT for all downstream ports
  - The TT could handle 64 periodic Start-Split transactions, 32 periodic Complete-Split transactions, and 6 none-periodic transactions;

- Supports Ganged Power Control mode

- Provides two clock output: one 12MHz and one 24MHz; and Remote-Wake-Up Alert input.

FE4.3 USB 2.0 Dual-Charging-Port Hub Controller

Introduction

The Terminus FE4.3 is an USB 2.0 High-Speed Dual-Port hub with special features to support GSM Associations`s „Universal Charging Solution", (UCS). It is fully compliant to USB-IF „Universal Serial Bus Specification Revision 2.0" and supports „Battery Charging Specification Revision 1.1".

FE4.3 is especially designed to provide USB battery charging capabilities to battery operated portable system, that is, adding USB Charging Downstream Ports to notebook or netbook type of systems.
FE4.3 is able to communicate with the power management control module of the system and perform versatile charging behavior control based on the system power source status and battery condition.

FE 4.3

USB 2.0 Dual-Charging-Port Hub Controller

With its extreme low power consumption and tiny footprint, FE4.3 could be easily fit into any design. The high quality of FE4.3 is guaranteed by Design-For-Testing with comprehensive scan chains and Built-In-Self-Test modes which could exercise all High-, Full-, and Low-Speed analog front end (AFE) components on the packing and testing stages.

Package

24-Pin WQFN

□ Body Size: 4mm x 4mm
□ Pitch: 0.5mm
□ Exposed Pad: 2.8mm x 2.8mm

Features

➤ Fully compliant with Universal Serial Bus Specification Revision 2.0 (USB 2.0);
  • Upstream Facing Port supports High-Speed (480MHz) and Full-Speed (12MHz) modes;
  • 2 Downstream Facing Ports support High-Speed (480MHz), Full-Speed (12MHz), and Low-Speed (1.5MHz) modes;

➤ Compliant with Universal Charging Solution, and USB Battery Charging Specification 1.1

➤ Integrated USB 2.0 Transceivers;

➤ Integrated downstream facing ports USB Charger detection circuit;

➤ Integrated upstream 1.5KΩ pull-up, downstream 15KΩ pull-down, and serial resisters

➤ Integrated 5V to 3.3V and 1.8V regulators;

➤ Integrated Power-On-Reset with power failure detection circuit;

➤ Integrated 12MHz Oscillator with feedback resister and crystal load capacitors;

➤ Integrated 12MHz-to-480MHz Phase Lock Loop (PLL);

➤ Integrated Portable Device detection circuitry for UCS supporting;

  Single Transaction Translator (STT)
  • One TT for both downstream ports
  • The TT could handle 64 periodic Start-Split transactions, 32 periodic Complete-Split transactions, and 6 none-periodic transactions;

➤ Supports Individual Power Control mode and Individual Over-Current Detection mode;

➤ Provides two Portable Device Detection (or Charging Request) indicator output – one for each downstream facing port;

➤ Support Hub Enable and High-Power Enable input

➤ Support Microsoft Windows 98SE/XE, 2000, XP, Vista, and Windows 7;

➤ Support Mac OS 8.6 and above;

➤ Support Linux kernel 2.4.20 and above.

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