FE1.1s – *Revision B*

USB 2.0 HIGH SPEED 4-PORT HUB CONTROLLER

Data Sheet

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 1.1/1.2*".

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.

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, Full-Speed, and Low-Speed (12MHz) modes;
- Compliant with Universal Charging Solution, and USB Battery Charging Specification 1.1/1.2.
- Integrated USB 2.0 Transceivers;
- Integrated upstream 1.5KΩ pull-up, downstream 15KΩ pull-down, and serial resistors;
- Integrated 5V to 3.3V and 1.8V regulators;
- Integrated Power-On-Reset with power failure detection circuit;
- Integrated 12MHz Oscillator with feedback resistor and crystal load capacitors;
- Integrated 12MHz-to-480MHz Phase Lock Loop (PLL);
- Integrated Portable Device detection circuitry for UCS supporting;
- *Single Transaction Translator* (Single TT) –

  - 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 II

24-Pin WQFN
(Body Size: 4mm x 4mm, Pitch: 0.5mm)
(Exposed Pad: 2.8mm x 2.8mm)

PIN ASSIGNMENT

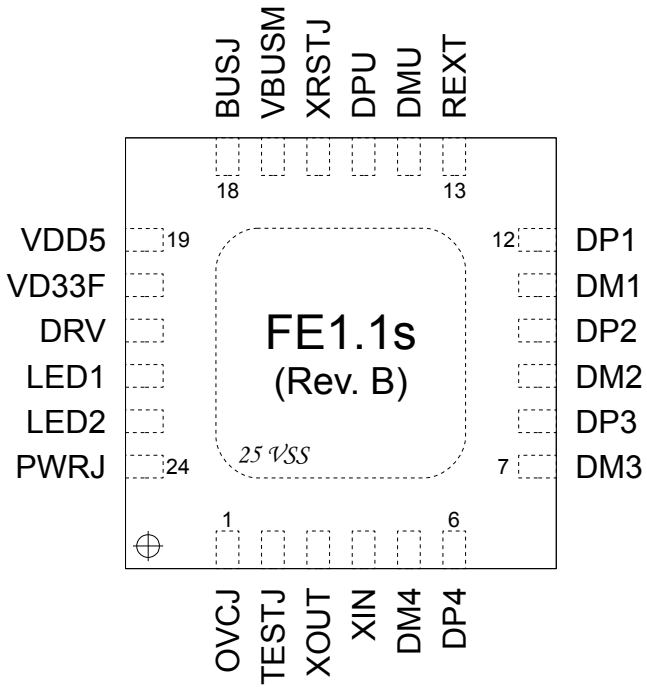
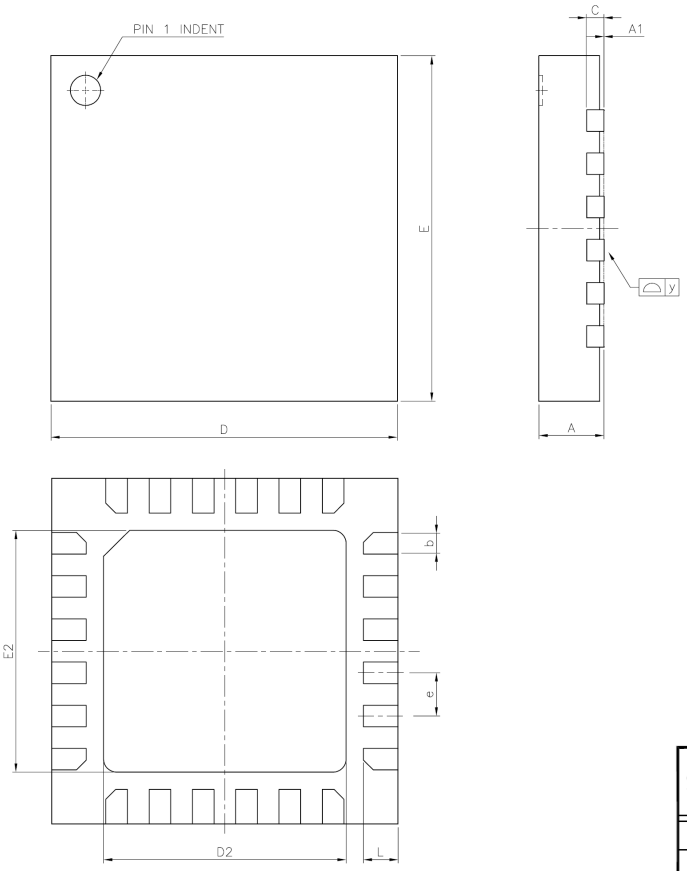


Fig. 3: 24-Pin WQFN Pin Assignment

PACKAGE II

24-pin WQFN (Body Size: 4x4 mm, Pitch: 0.5mm, Exposed Pad: 2.8x2.8mm)



SYMBOLS	DIMENSIONS IN MILLIMETERS		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
b	0.18	0.23	0.30
C	0.19	0.20	0.25
D	3.90	4.00	4.10
1 D2	——	2.80	——
E	3.90	4.00	4.10
1 E2	——	2.80	——
e	——	0.50	——
L	0.30	0.40	0.50
y	0.00	——	0.076