USB5537

7/4-Port SS/HS USB Hub Controller

PRODUCT FEATURES

Data Brief

General Description

The SMSC USB5537 hub is a 7-port, low-power, configurable Hub Controller fully compliant with the *USB 3.0 Specification*. The USB5537 supports 5 Gbps SuperSpeed (SS), 480 Mbps Hi-Speed (HS), 12 Mbps Full-Speed (FS) and 1.5 Mbps Low-Speed (LS) USB signalling for complete coverage of all defined USB operating speeds.

The USB5537 supports the legacy USB speeds through its USB 2.0 hub controller. The new SuperSpeed hub controller operates in parallel with the USB 2.0 controller, so the 5 Gbps SuperSpeed data transfers are not affected by the slower USB 2.0 traffic.

The USB5537 is configured for operation through internal default settings, where custom configurations are supported through an on-chip OTP ROM or an external SPI ROM.

All LED and port control signal pins are under firmware control in order to allow for maximum operational flexibility; those pins can also be configured as GPIOs.

Features

- USB 3.0 compliant 5 Gbps, 480 Mbps, 12 Mbps and 1.5 Mbps operation, USB pins are 5 V tolerant
  - Integrated termination and pull-up/pull-down resistors
- Four downstream USB 3.0 ports (which also support USB 2.0) and 3 additional USB 2.0 ports for non-removable devices
- Optimized for low-power operation and low thermal dissipation
- Configuration via OTP ROM or SPI ROM
- On-chip 8051 µC manages GPIOs, VBUS, and other hub signals
- 8 K RAM, 32 K ROM
- Power Management capability on the GPIO/LED pins
- LED Modes
  - Speed mode, SS vs. non SS
  - Slightly enhanced SS, HS, FS, LS indication
  - LEDs blink relative to data activity on that port
- One Time programmable (OTP) ROM: 8 kbit
  - Includes on-chip charge pump
  - Values written via JTAG
- Single 25 MHz XTAL or clock input for all on-chip PLL and clocking requirements
- Battery charging operation
  - Emulate China Charger when "headless"
  - Legacy charging when "headless" (Blackberry, Apple, Motorola)
  - USB-IF Battery Charging 1.1/1.2 support as a DCP when "headless"
  - USB-IF Battery Charging 1.1/1.2 support as a CDP when connected to USB Host
  - European Union Charger Support
  - Supports PMBus and I^2C on a single interface for all ports as well as individual interfaces for each port
- Supports JTAG boundry scan
- PHYBoost (USB 2.0)
  - Selectable drive strength for improved signal integrity
- VariSense (USB 2.0)
  - controls the receiver sensitivity enabling four programmable levels of USB signal receive sensitivity
- IETF RFC 4122 compliant 128-bit UUID

Software Features

- Compatible with Microsoft Windows 7, Vista, XP, Mac OS X 10.4+, and Linux Hub Drivers (USB 2.0)
- TRUESpeed LEDs (configuration dependent)
  - Multi color LED scheme vividly shows port capability and operating speed
  - Embedded 8051 Micro controller for Hub configuration
- Standard hub I/O (port power, over-current sense, LEDs) are GPIOs controlled by a µC instead of hard coded functions to allow for flexibility for OEM differentiation

Applications

- Mobile PC docking
- LCD monitors and TVs
- Portable expansion hubs
- PC motherboards
- Set-top boxes, DVD players, DVR/PVR

PRODUCT REVIEW

Order Number(s):

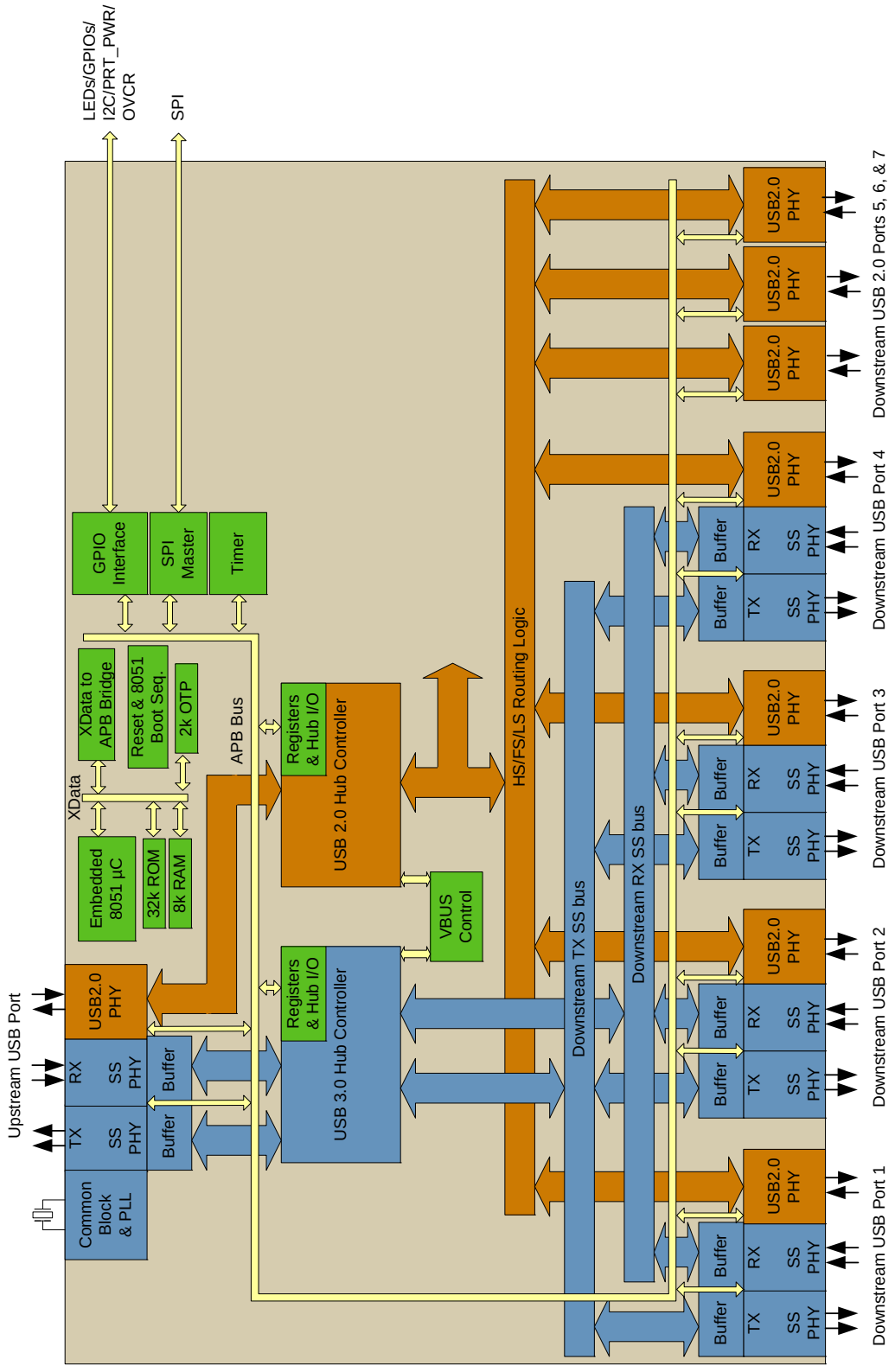
ORDER NUMBERS	PACKAGE TYPE	PACKAGE SIZE	REEL SIZE
USB5537-AKZE	72-Pin QFN Lead-Free, RoHS Compliant Package	10x10 mm	-
USB5537-AKZE-TR			3000

This product meets the halogen maximum concentration values per IEC61249-2-21

For RoHS compliance and environmental information, please visit www.smsc.com/rohs

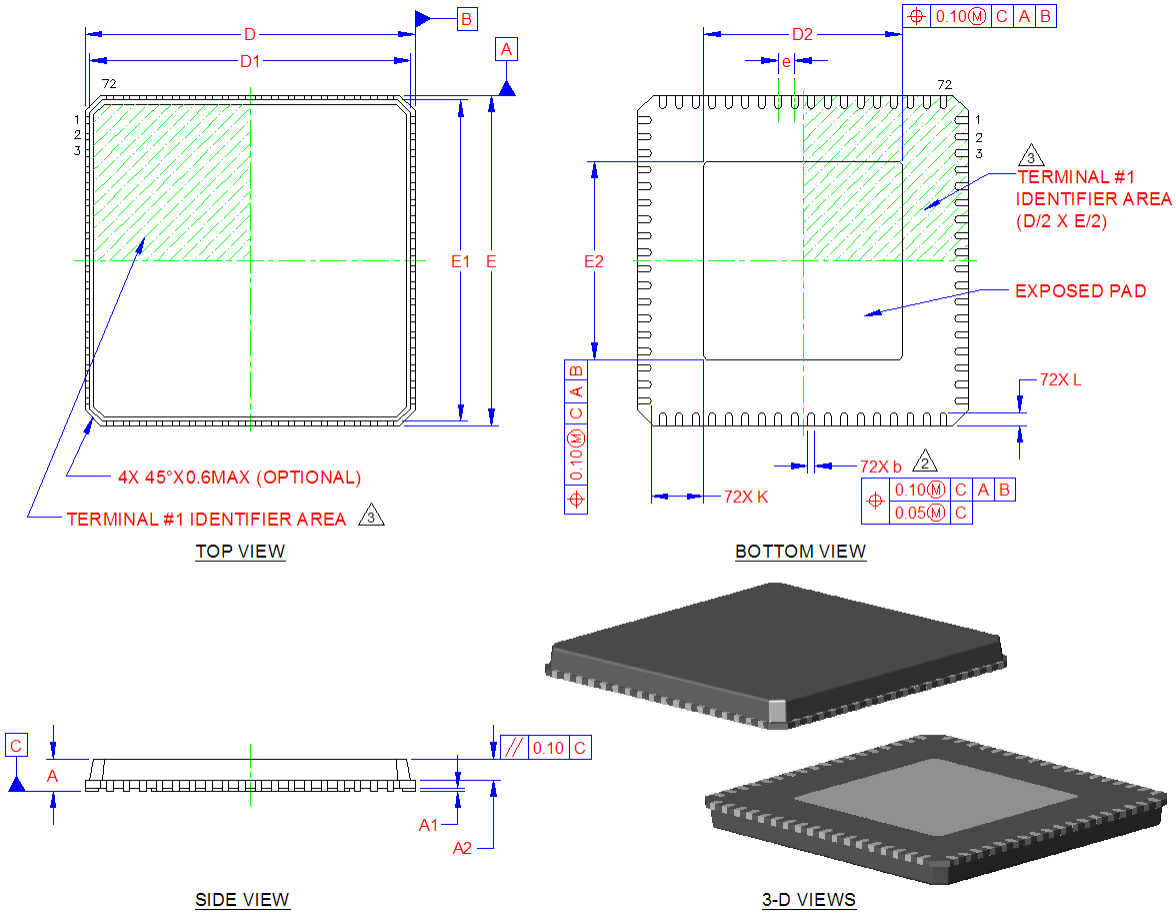
80 ARKAY DRIVE, HAUPPAUGE, NY 11788 (631) 435-6000 or 1 (800) 443-SEMI

Block Diagram



PRODUCT REVIEW

Package Outline



The USB5537 72-Pin QFN Package Outline (10x10 mm Body, 0.5 Pitch, 3.1 ePad)

	MIN	NOMINAL	MAX	NOTE	REMARKS
A	0.80	0.85	1.00	-	Overall Package Height
A1	0	0.02	0.05	-	Standoff
A2	-	0.65	0.80	-	Mold Cap Thickness
D/E	9.90	10.00	10.10	-	X/Y Overall Body Size
D1/E1	9.65	9.75	9.85	-	X/Y Mold Cap Size
D2/E2	5.90	6.00	6.10	-	X/Y Exposed Pad Size
L	0.30	0.40	0.50	-	Terminal Length
b	0.18	0.25	0.30	2	Terminal Width
K	1.50	-	-	-	Terminal to ePad Clearance
e	0.50 BSC			-	Terminal Pitch

Notes:

1. All dimensions are in millimeters.
2. Applies to plated terminals and is measured between 0.15 and 0.30 mm from the terminal tip
3. Details of terminal #1 identifier are optional but must me located within the area indicated. The terminal #1 identifier may be either a mold or marked feature.