



USB3500



Hi-Speed USB Host, Device or OTG PHY With UTMI+ Interface

PRODUCT FEATURES

Data Brief

- USB-IF “Hi-Speed” certified to the Universal Serial Bus Specification Rev 2.0
- Interface compliant with the UTMI+ Specification, Revision 1.0.
- Includes full support for the optional On-The-Go (OTG) protocol detailed in the On-The-Go Supplement Revision 1.0a specification.
- Functional as a host, device or OTG PHY.
- Supports HS, FS, and LS data rates.
- Supports FS pre-amble for FS hubs with a LS device attached (UTMI+ Level 3)
- Supports HS SOF and LS keep alive pulse.
- Supports Host Negotiation Protocol (HNP) and Session Request protocol (SRP.)
- Internal comparators support OTG monitoring of VBUS levels.
- Low Latency Hi-Speed Receiver (43 Hi-Speed clocks Max)
- Internal 1.8 volt regulators allow operation from a single 3.3 volt supply
- Internal short circuit protection of ID, DP and DM lines to VBUS or ground.
- Integrated 24MHz Crystal Oscillator supports either crystal operation or 24MHz external clock input.
- Internal PLL for 480MHz Hi-Speed USB operation.
- Supports USB 2.0 and legacy USB 1.1 devices
- 55mA Unconfigured Current (typical) - ideal for bus powered applications.
- 83uA suspend current (typical) - ideal for battery powered applications.
- Full Commercial operating temperature range from 0C to +70C
- 56 Pin QFN lead-free RoHS compliant package (8 x 8 x 0.90 mm height)

ORDER NUMBER:
USB3500-ABZJ FOR 56 PIN, QFN LEAD-FREE ROHS COMPLIANT PACKAGE



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General Description

The USB3500 is a stand-alone Hi-Speed USB Physical Layer Transceiver (PHY). The USB3500 uses a UTMI+ interface to connect to an SOC or FPGA or custom ASIC. The USB3500 provides a flexible alternative to integrating the analog PHY block for new designs.

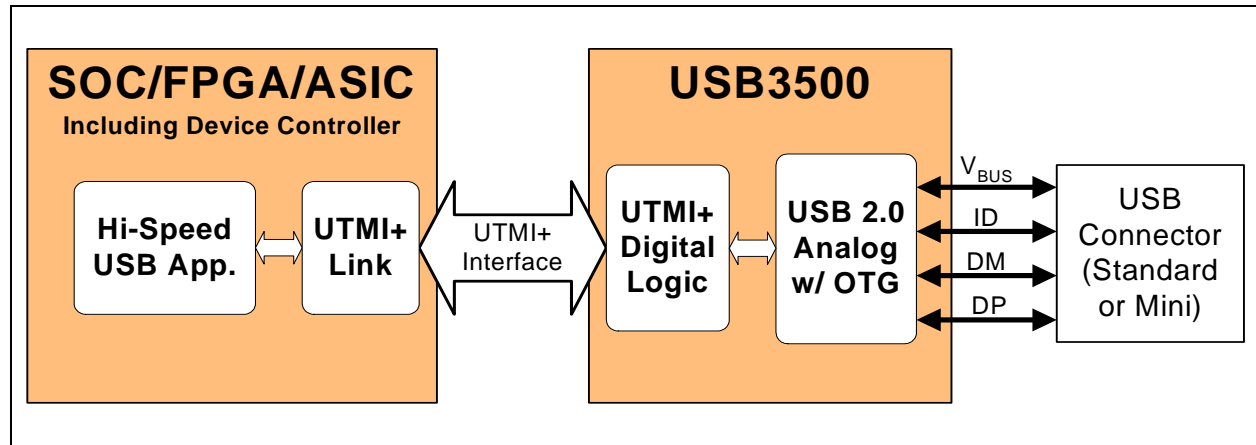


Figure 1 Basic UTMI+ USB Device Block Diagram

The USB3500 provides a fully compliant USB 2.0 interface, and supports High-Speed (HS), Full-Speed (FS), and Low-Speed (LS) USB. The USB3500 supports all levels of the UTMI+ specification as shown in Figure 2, "UTMI+ Level 3 Support".

The USB3500 can also, as an option, fully support the On-the-Go (OTG) protocol defined in the On-The-Go Supplement to the USB 2.0 Specification. On-the-Go allows the Link to dynamically configure the USB3500 as host or peripheral configured dynamically by software. For example, a cell phone may connect to a computer as a peripheral to exchange address information or connect to a printer as a host to print pictures. Finally the OTG enabled device can connect to another OTG enabled device to exchange information. All this is supported using a single low profile Mini-AB USB connector.

Designs not needing OTG can ignore the OTG feature set.

The USB3500 uses SMSC's advanced proprietary technology to minimize power dissipation, resulting in maximized battery life in portable applications.

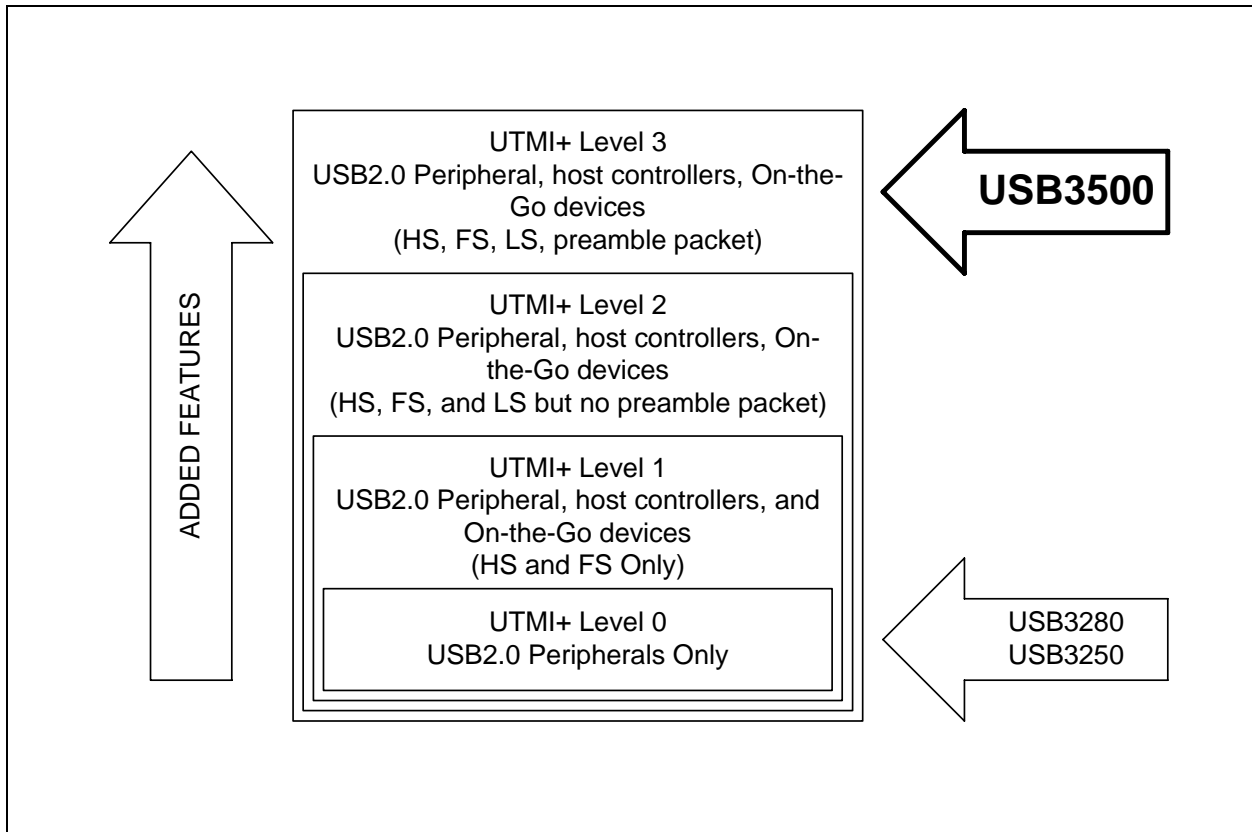


Figure 2 UTMI+ Level 3 Support

2.1 Applications

The USB3500 is targeted for any application where a hi-speed USB connection is desired.

The USB3500 is well suited for:

- Cell Phones
- MP3 Players
- Scanners
- Printers
- External Hard Drives
- Still and Video Cameras
- Portable Media Players
- Entertainment Devices

Block Diagram

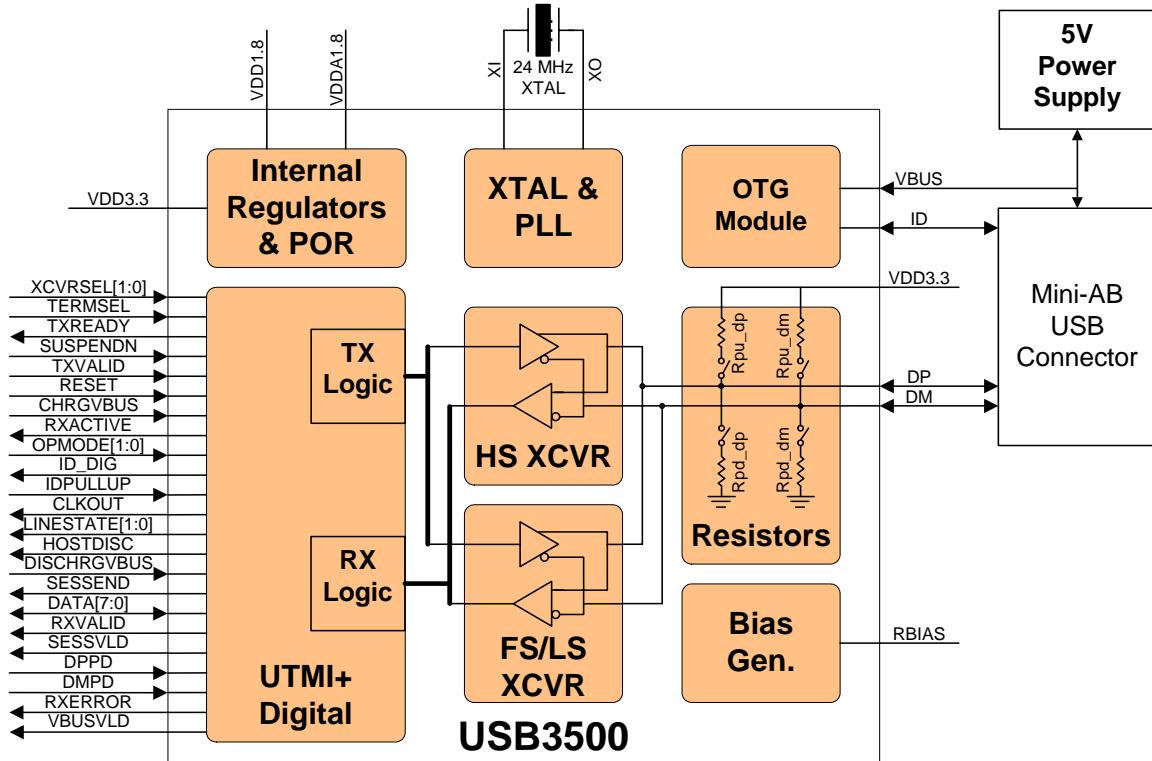


Figure 3 USB3500 Block Diagram

Pin Configuration

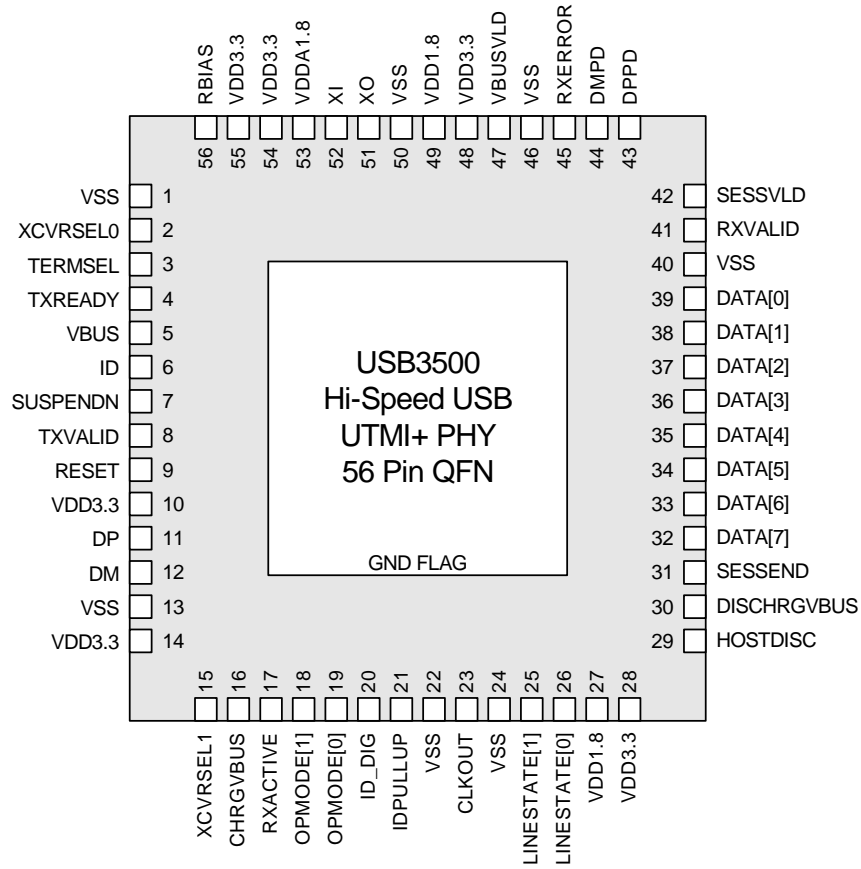


Figure 4 USB3500 Pin Configuration

Package Outline

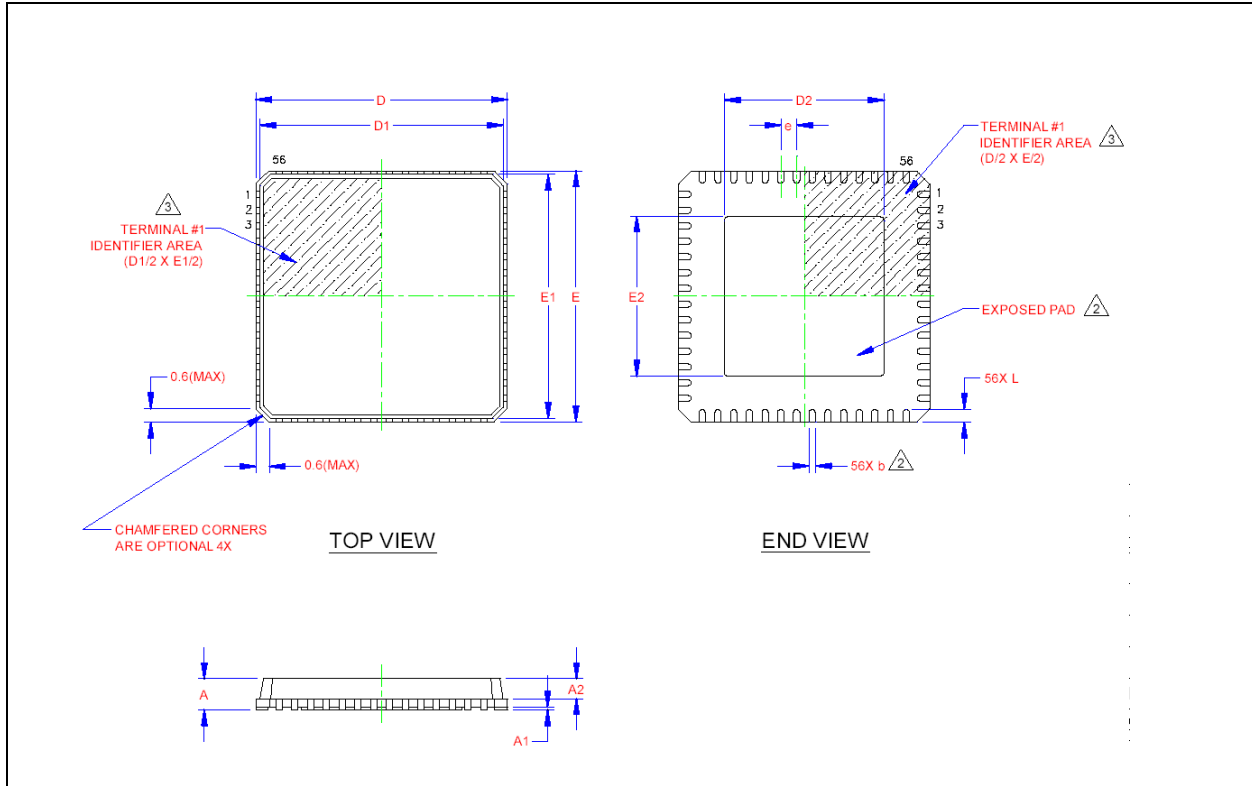


Figure 5 USB3500-ABZJ 56 Pin QFN Package Outline, 8 x 8 x 0.9 mm Body (Lead Free)

Table 1 56 Terminal QFN Package Parameters

	MIN	NOMINAL	MAX	REMARKS
A	0.70	~	1.00	Overall Package Height
A1	0	0.02	0.05	Standoff
A2	0.60	~	0.90	Mold Thickness
A3	0.20 REF			Copper Lead-frame Substrate
D	7.85	8.00	8.15	X Overall Size
D1	7.55	~	7.95	X Mold Cap Size
D2	2.25	4.5	6.80	X exposed Pad Size
E	7.85	8.00	8.15	Y Overall Size
E1	7.55	~	7.95	Y Mold Cap Size
E2	2.25	4.5	6.80	Y exposed Pad Size
L	0.30	~	0.55	Terminal Length
e	0.50 Basic			Terminal Pitch
b	0.18	~	0.30	Terminal Width

Notes:

1. Controlling Unit: millimeter.
2. Dimension b applies to plated terminals and is measured between 0.15mm and 0.30mm from the terminal tip. Tolerance on the true position of the leads is ± 0.05 mm at maximum material conditions (MMC).
3. Details of terminal #1 identifier are optional but must be located within the zone indicated.