IP Cores & FPGA Design services
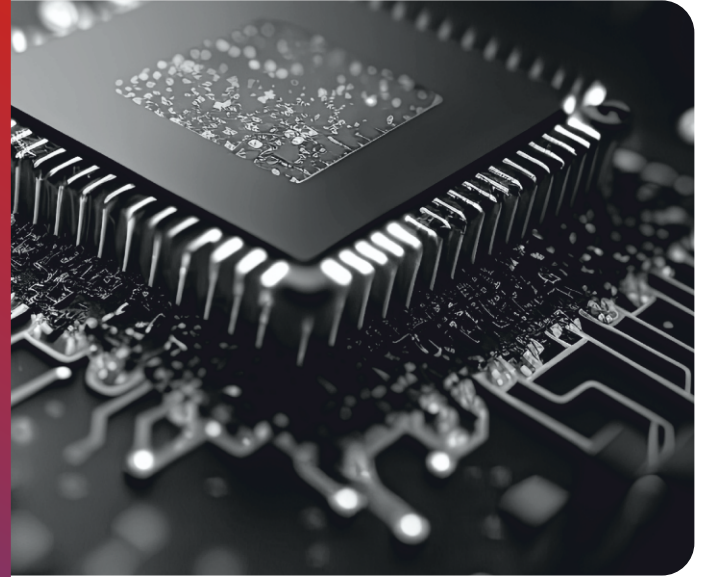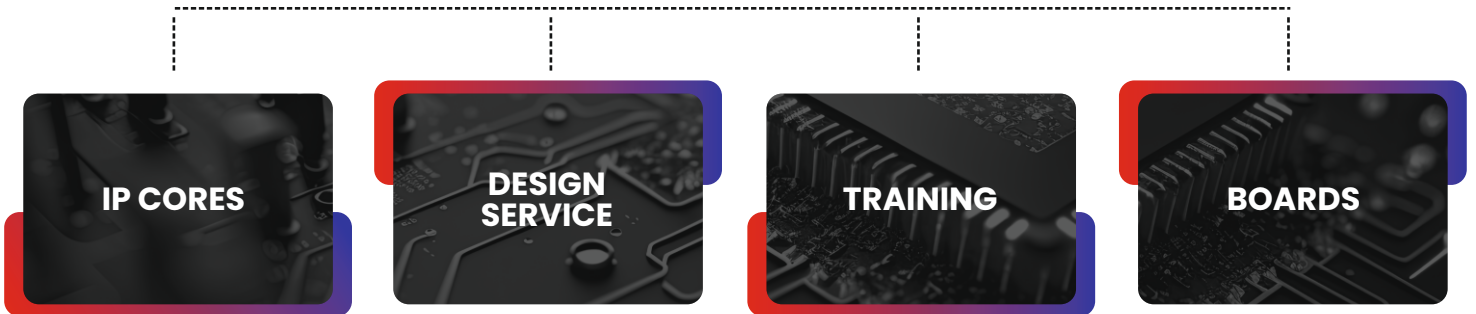
Building trust and reliability for more than 20 years

USB Portfolio

- USB 1.1 Device
- USB 1.1 Host
- USB 2.0 Device
- USB 2.0 HUB
- USB 2.0 Host
- USB 2.0 OTG
- USB3.2 GEN 1 Device
- USB3.2 GEN 2x1 Device

LATTICE
SEMICONDUCTOR
PARTNER NETWORK

IP CORES

DESIGN SERVICE

TRAINING

BOARDS

SLS Expertise

- Proud Member of Lattice Partner Network
- IP Core Development
- IP Core Customization
- FPGA Turnkey Solutions
- Product Customization Solutions
- ASIC to FPGA Solutions
- Driver Development
- Flexible Business Policy
- Excellent Customer Support
- Serving Customers For 20+ Years

Use Case

I/O Aggregator over USB
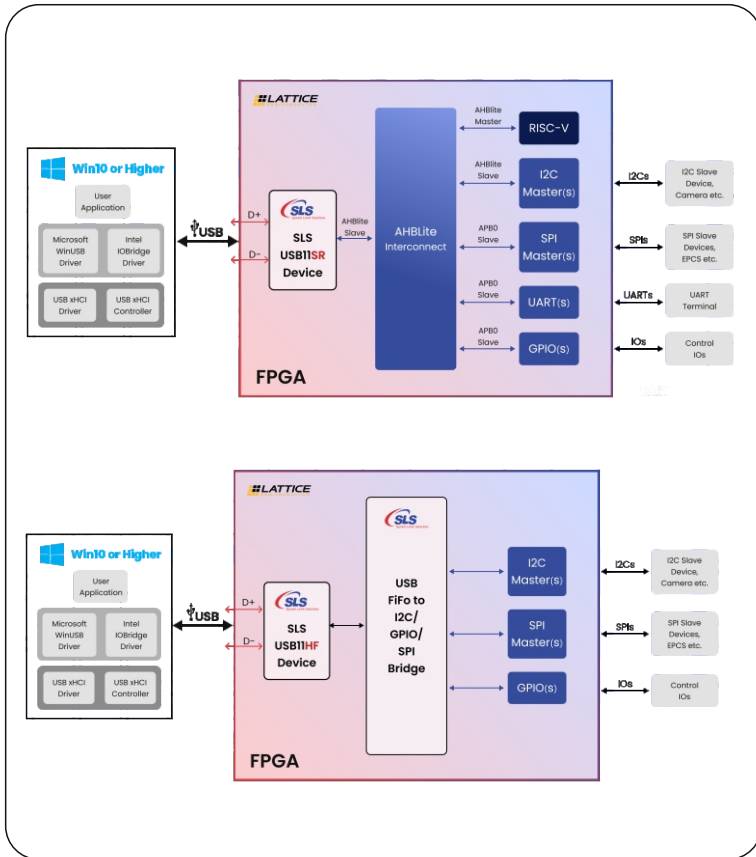
- USB to Peripheral Interface Bridging
- Signal protocol conversion from USB to I2C, SPI, and GPIO
- Signal aggregation and de-aggregation over USB
- Supports USB1.1 - 12Mbps
- Uses FPGA IOs for D+/D-
- No External PHY required
- No custom driver required
- Supports Windows OS built in WinUSB Driver
- Supports Intel IOBridge Driver
- With RISC-V / Without RISC-V
- USB20 HS (480Mbps) mode can be supported using external ULPI PHY
- Easy OS porting

Dual MIPI D-PHY CSI-2 ‹› USB3 Bridge On CrossLink-NX

- USB Video Class (UVC) Compliant
- Dual MIPI Camera sensors
- Supports Uncompressed FHD (1920x1080) resolutions @30/60 fps
- Supports Intel IOBridge Driver for IO (I2C & GPIO) Control
- Full Source Code For RISC-V
- Supports USB3.2 Gen1 (5Gbps) using FPGA Transceiver
- Supports USB2.0 FS (12Mbps) using FPGA IOs for D+/D-
- Single chip solution. No External USB PHY required
- Uses Windows OS built in WinUSB & UVC Drivers
- Multiple low speed peripheral (I2C, SPI, IO etc) control over USB
- Easily updated to support Linux/MacOS
- Customized USB3 Endpoint interface to use mix mode interface:
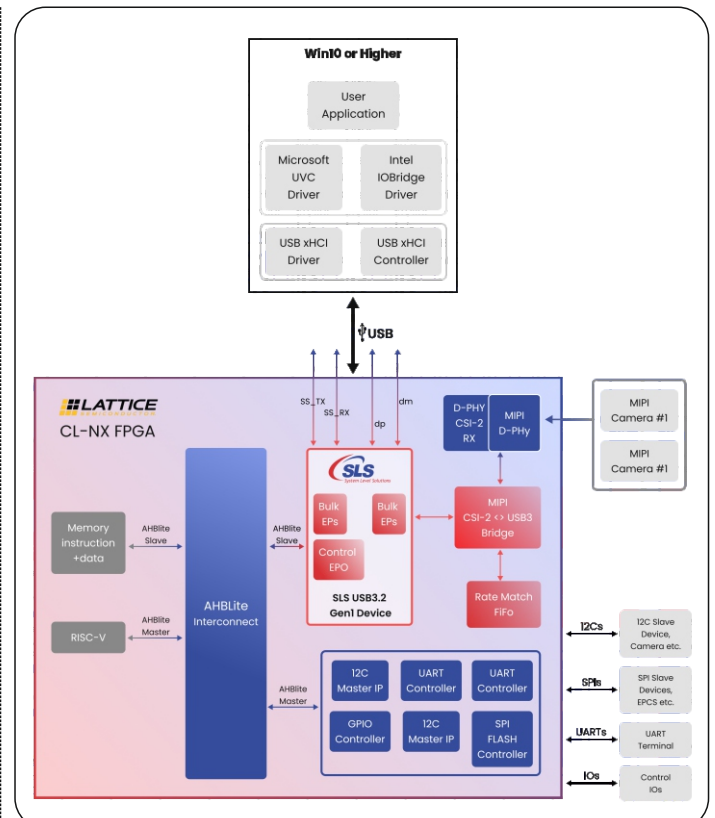
USB3.2 SF Gen 1 Device Controller

A one-stop solution for USB 3.2 and USB 2.0

USB3.2 Gen 1x1 Device Controller

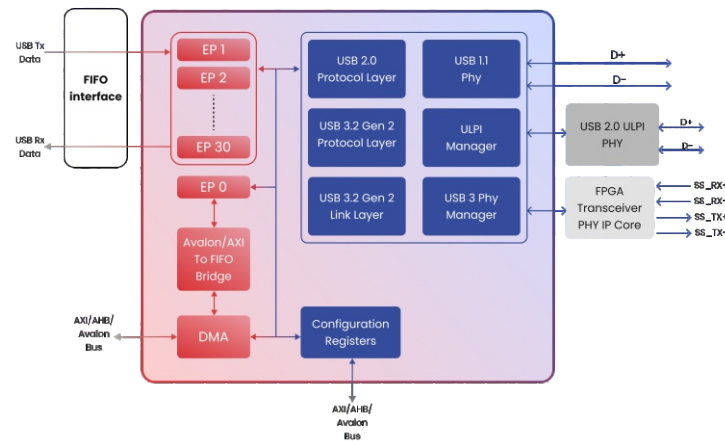■ It is designed using Lattice FPGA built-in Transceiver

USB3.2 Specific Features

■ Supports SuperSpeed (SS - USB3.2 Gen 1x1) mode
■ Uses FPGA built-in Transceiver as a PHY layer and thus eliminates need for external PHY for USB3.1

USB 2.0 Specific Features

■ Supports High Speed (HS) and Full Speed (FS) modes
■ ULPI interface to interact with external USB 2.0 PHY for HS/FS Mode
■ In-built PHY implemented for USB FS Mode

Ease of Use

■ Simple FIFO interface to transfer data over non-control endpoint
■ Integrated into the Radiant Ecosystem

■ Capable to support up to 31 endpoints (1 default control endpoint, 15 IN endpoints, and 15 OUT endpoints)
■ Configurable number of buffers per endpoint

USB20 Host/Device Controller

A one-stop solution for USB 2.0

Features

■ Supports High Speed (HS) and Full Speed (FS) modes
■ ULPI interface to interact with external USB 2.0 PHY for HS/FS Mode
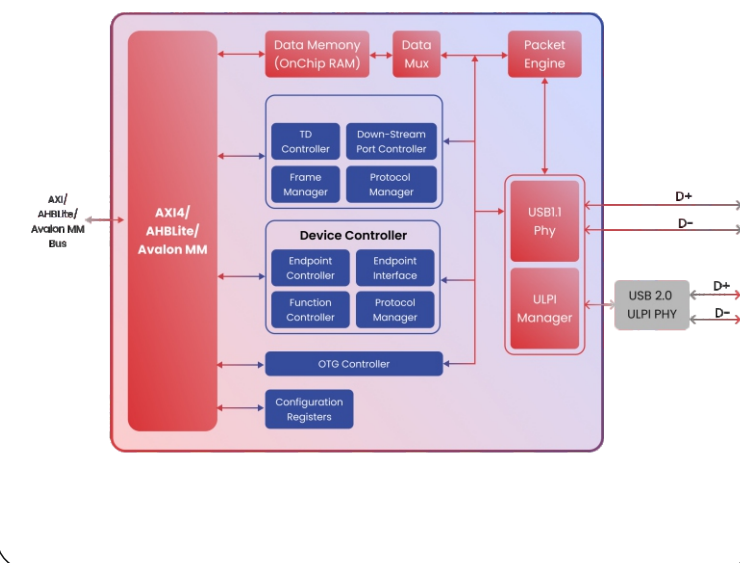■ In-built PHY implemented for USB FS Mode
■ Configurable Memory depth
■ Configurable to use as HOST only mode or DEVICE only mode

Host Controller

■ Supports Control, Bulk, Isochronous and Interrupt transfers
■ Supports PING protocol
■ Supports SPLIT transaction for High Speed hub
■ Optimized TD (Transfer Descriptor) structure
■ Supports 16 Interrupt and 16 Aperiodic Tds
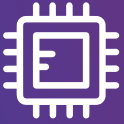
Device (Peripheral) Controller

■ Supports Control, Bulk, Interrupt and Isochronous transfers
■ Capable to support up to 31 endpoints
    ■ (1 default control endpoint + 15 IN/OUT endpoints)

■ Supports software configurable endpoints
■ Supports Suspend, Resume and Remote Wakeup features

About SLS

System Level Solutions, established in 2001, is a leading manufacturer and turnkey solution provider. With over 21+ years of expertise, SLS caters to businesses globally across multiple industries, including EV charging infrastructure, home and industrial automation, IoT-based solar, smart street lighting, FPGA & IP cores, and numerous testing facilities.

The team of 300+ in-house staff is currently working across 8+ business verticals, operating from bases in India, UK, and USA. Along with the Make-In-India initiative, the in-house design and manufacturing capabilities and strong research and development competencies enable SLS to deliver market-ready products that meet specific business requirements.
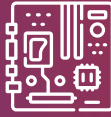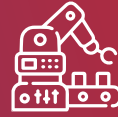
OUR SERVICES

IP Core & FPGA Design

Hardware Design

Software Development

In-house Manufacturing

Our Subsidiaries

VerdeMobility
CHARGING INTO THE FUTURE

Avartanam
PRODUCT TESTING THE RIGHT WAY

SUNSIGHTS
A Sustainable and Secure Source of Energy

Our Verticals

FPGA/IP Core

NEBULAE
DESIGN TO CONNECT

ViaLights

Konnsys
Connecting Sensors With Systems

DigitalSyne

YALGAAR
A Real-time Messaging Framework

LOCCARTO
Tracking made easy