BLOCKX-SEMI PROFILE

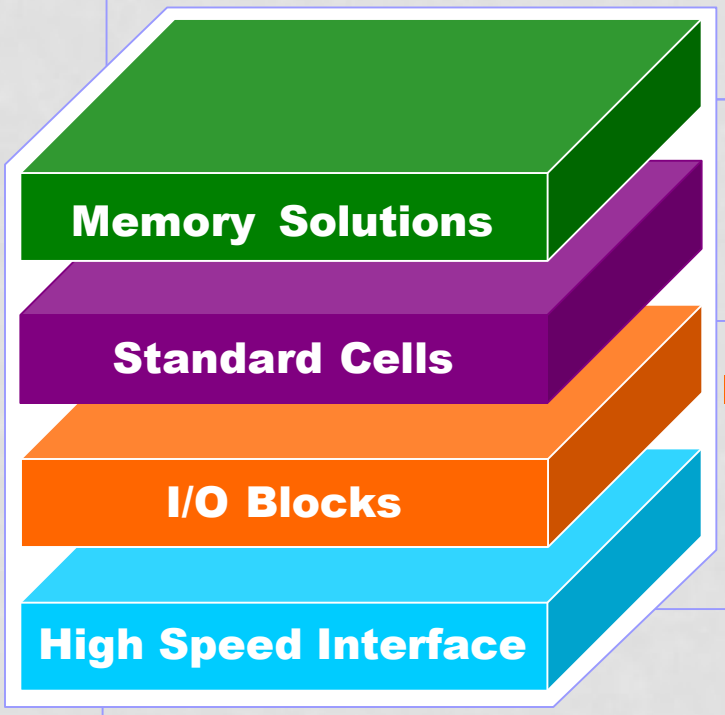
MISSION

BLOCKX-SEMI Technology is focused on providing Value added, high performance and low power, quality Semiconductor IP (SIP) to maximize the efficiency of hardware design teams. BLOCKX-SEMI is committed to:

1. **Provide a comprehensive high quality Semiconductor IP to satisfy most customer's needs and provide a one stop solution.**
2. **Promptly respond to customer's design requests.**
3. **Leverage on already silicon proven designs and various foundry process capabilities.**

OUR CUSTOMERS

PRODUCT OVERVIEW



- SRAM, RF, ROM Compilers
- Hi-Performance & Ultra Low Power
- BCAM / TCAM
- Memory BIST

- High Speed/ High Density
- Ultra High Density/ Ultra Low Power Libraries
- Watchdog Libraries

- Specialty I/O's(LVDS, PCI, I2C/I3C, SMB, ONFI)
- High Speed DDR I/O Combo
- Standard GPIO Libraries

- DDR4/3/2 LPDDR5/4/3/2 PHY
- Memory Controller
- Interface Controller

MEMORY PRODUCTS

- **Single and Dual Port SRAM** with both Row and Column redundancy with following Low Power options:
  - Low Leakage (light and deep sleep)
  - Power Gating with retention and without retention
  - Dual Rail (SRAM Periphery at lower Voltage)
  - Input Isolation
- **1-Port and 2-port Register File** with Column redundancy and all the above Low power options
- **Pseudo 2-Port Register Files** Compiler
- **Multi-Banking Single Port SRAM** compiler for larger SRAMs
- **ROM** Compiler
- **Memory BIST and Repair**

MEMORY PROCESS NODES

- 3/5/6/7 FF/FF+
- 12 FFC/FFC+
- 16 FFC/FF+
- 22 ULL/ULP
- 28 HPCP/ULL/ULP
- 40/55/65 LP/ULP/GP
- 80/90 GP

STANDARD CELLS PRODUCTS

- Up to 11000 cells
- Available in multiple channel lengths
- Thick-oxide Always-on, 1.8V and 2.5V
- Low Power Library Variant
- High Performance Library Variant

STANDARD CELLS PRODUCTS

	7+/7/ 6/5/3nm	12nm	16nm	28/ 22nm	40nm	65/ 55nm	90/ 80nm
6 track	☑	☑	☑		☑	☑	
6.5 track				☑			
7 track				☑	☑	☑	☑
7.5 track	☑		☑				
8 track	☑						
9 track	☑		☑	☑			
10 track				☑	☑	☑	☑
10.5 track			☑				
12 track			☑	☑	☑		
14 track				☑			

3NM STANDARD CELLS PRODUCTS

- **5.5 Track**, Ultra High Density, Low Power
- **6.5 Track**, Very High Density, Low Power

Libraries available in 2 poly pitches of 48 and 54nm

5/4NM STANDARD CELLS PRODUCTS

- **6 Track**, Ultra High Density, Low Power
- **8 Track**, Very High Density, Low Power

Libraries available in 2 poly pitches of 51 and 57nm

I/O PRODUCTS

	7+/7/ 6/5/3nm	12nm	16nm	28/ 22nm	40nm	65/ 55nm	90/ 80nm
GPIO	☑	☑	☑	☑	☑	☑	☑
DDR/LPDDR	☑	☑	☑	☑	☑	☑	☑
I²C/I³C, I²S	☑	☑	☑	☑	☑	☑	☑
LVDS	☑	☑	☑	☑	☑	☑	☑
CML	☑	☑	☑	☑			☑
LVPECL	☑	☑	☑				☑
eMMC	☑	☑	☑	☑	☑	☑	
ONFI	☑	☑	☑	☑	☑		
MDIO	☑	☑	☑				
RGMII	☑	☑	☑	☑			
Osc. Pad	☑	☑	☑	☑	☑	☑	
Multi Func.				☑	☑	☑	☑

3NM IO PRODUCTS

- **GPIO** 1.2v/1.8v **Capable, Failsafe** IO
- **LPDDR4** IO
- **I³C** 1.2v/1.8v capable supporting different speeds
- **LVDS**
- **Oscillator Pad** (32K and 1-50MHz)
- **DLL**

3NM IO PRODUCTS (UNDER DEVELOPMENT)

- **GPIO** 1.2v/1.8v **Tolerant**
- **DDR IO (A)** DDR5/4/3/3L and LPDDR4/3/2 Combo for
- 1.1/1.2/1.36/1.5v operation depend on standard (4266 Mbps)
- **DDR IO (B)** DDR5/DDR4 Combo IO (6400Mbps)
- **DDR IO (C)** LPDDR5/4x IO for 0.5v/0.6v operation (6400Mbps)
- **I²C** 1.2v/1.8v capable supporting different speeds
- **CML, LVPECL**
- **eMMC, ONFI** 5, 4.2 **; MDIO, RGMII**

7/6, 5/4NM IO PRODUCTS

- **GPIO** 1.8v/3.0v (5nm: 1.65v max) **Tolerant, Failsafe** IO
- **GPIO** 1.2v/1.8v/2.5v/3.0v* **Capable, Failsafe** IO
- *7nm: 3.3v max, 5nm: 2.7v max (supporting 3.3v in progress)
- **DDR IO (A)** DDR5/4/3/3L and LPDDR4/3/2 Combo for 1.1/1.2/1.36/1.5v operation depend on standard (4266 Mbps)
- **DDR IO (B)** DDR5/DDR4 Combo IO (6400Mbps)
- **DDR IO (C)** LPDDR5/4x IO for 0.5v/0.6v operation (6400Mbps)
- **HSTL IO** 1.5v/1.8v
- **I²C/ I³C** 1.8v/3.3v capable supporting different speeds
- **LVDS , CML, LVPECL**

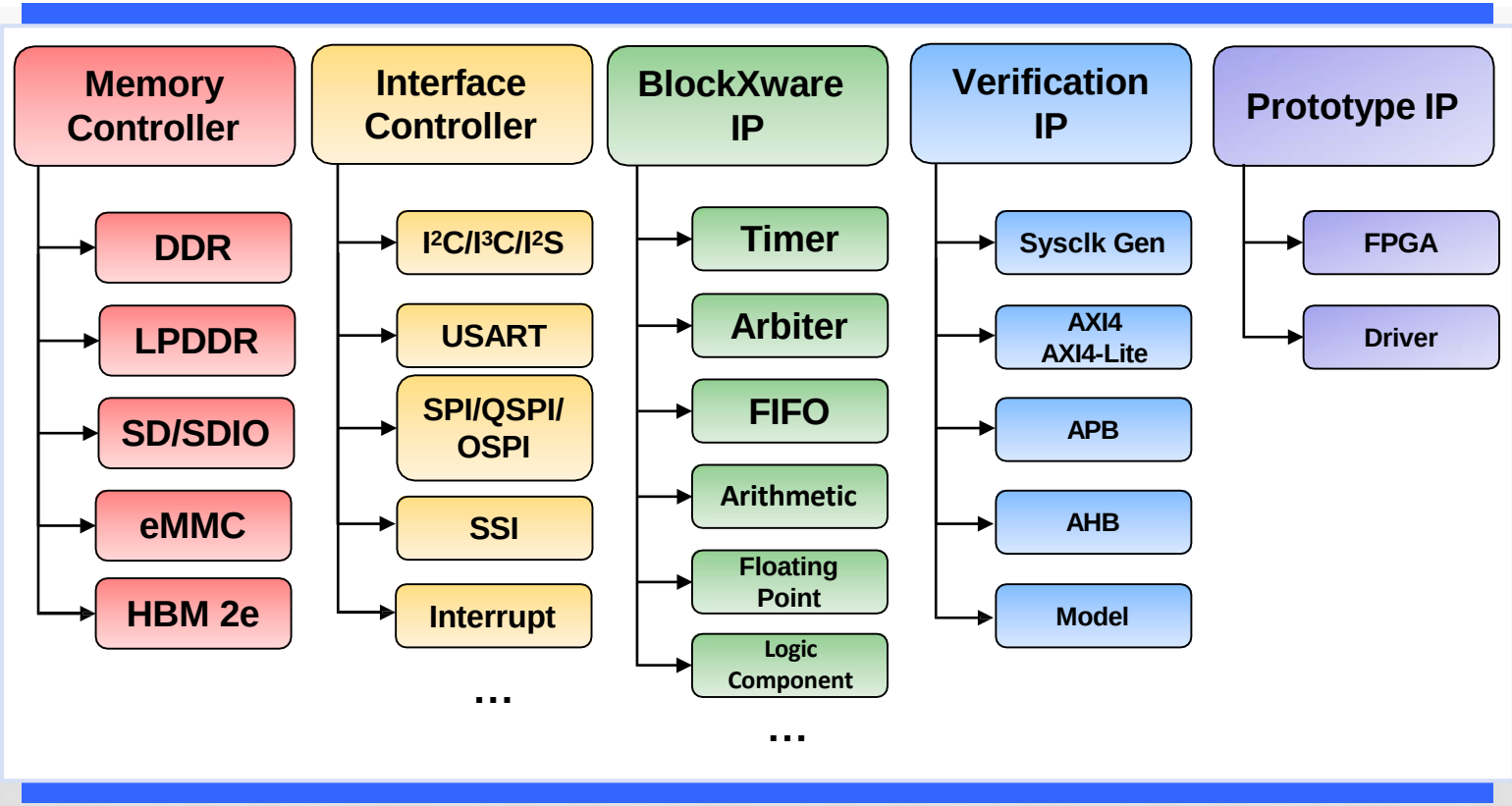
DDRX/LPDDRX PHY

- Fully configurable hardened DDR4/3/2, LPDDR5/4/3/2 PHY + DDR Controller Solution
- LPDDR4: Speed up to 4266Mbps
- LPDDR5: Speed up to 6400Mbps
- DFI 3.1/3.2/4.0 compliant
- Supports PHY independent read/write leveling & gate training
- Supports multi-rank, multi-gear ratio
- Built-in self testability
- Available in wire-bond and flip-chip versions
- Sideband and Inline ECC
- Compliance to automotive quality standard, fault coverage 99.8%

SOFTWARE PRODUCTS

- In-house EDA tool: Schematic, Layout, DRC/LVS
- Memory Compiler, IO Compiler
- Characterization flow, auto QA flow
- HDL Obfuscating, auto HDL generation

SOFT IP


Memory Controller
DDR
LPDDR
SD/SDIO
eMMC
HBM 2e
Interface Controller
I²C/I³C/I²S
USART
SPI/QSPI/ OSPI
SSI
Interrupt
...
BlockXware IP
Timer
Arbiter
FIFO
Arithmetic
Floating Point
Logic Component
...
Verification IP
SysClk Gen
AXI4 AXI4-Lite
APB
AHB
Model
Prototype IP
FPGA
Driver

PRODUCTS LIST

Memory Controller
Storage Controller

- SDR Controller
- DDR4/3/2 Controller
- LPDDR4/3/2 Controller
- LPDDR5 Controller (On Going)
- eMMC Controller
- SD/SDIO Controller
- UHS-II Controller
- HBM 2e (On Going)
- PSRAM Controller
- ONFI Controller (On Going)
- DMA Controller (On Going)

Peripheral Controller

BlockXware IP

Verification IP

PRODUCTS LIST

- Memory Controller
  Storage Controller
- **Peripheral Controller**
- BlockXware IP
- Verification IP

- I^2C, I^2S Controller
- I^3C Controller (On Going)
- UART/USART Controller
- SPI/QSPI/OSPI Controller
- SSI Controller
- Interrupt Controller
- JTAG Controller
- PVT Monitor
- GPIO Controller
- AXI4 Slave Interface
- APB Slave Interface
- AHB Slave Interface
- AXI4 Crossbar
- PWM Controller
- PDM2PCM, PCM2PDM
- Interface Bridge

PRODUCTS LIST

Memory Controller
Storage Controller

Peripheral Controller

BlockXware IP

Verification IP

- Data Integrity: encoder, decoder, ECC, CRC, AES, detector, parity...
- Arbiter
- Logic Component: counter, timer, registers, LFSR, multiplexer, DBI...
- FIFO
- Arithmetic Component: fixed and floating point adder, converter, multiplier, divider...

PRODUCTS LIST

Memory Controller
Storage Controller

Peripheral Controller

BlockXware IP

Verification IP

- APB verification IP
- AXI4 Master Bus-Functional-Model
- AXI4-Lite Master Bus-Functional-Model
- AXI4-Lite Verification IP
- AXI4 Verification IP
- AHB Verification IP
- Common Functions for Verification
- PCIe Verification IP
- Sequence manager
- System Clock Generator

QUALIFICATION

- Experience in AMBA specifications: AXI4, AXI4-Lite, APB, AHB
- Experience in Peripheral Interfaces: I^2C, I^2S, I^3C, USART, SPI,...
- Experience in JEDEC specifications: JESD229 (SDR), JESD79-4/3/2 (DDR), JESD209-5/4/3/2 (LPDDR), JESD235 (HBM), JESD84 (eMMC),...
- Experience in working with Synopsys, Mentor and Cadence Softwares for synthesis, simulation, DFT, Lint/CDC check, …
- Experience in developing full test environment using UVM
- Experience in FPGA Prototypes: Intel Altera, AMD Xilinx

BLOCKX-SEMI EXPERTISE

Design Soft IP (FE & BE)	Verification Soft IP	Release Soft IP	
Design Schematic Std-Cell	Layout Std-Cell	Characterize & Test Std-Cell	QA & Release Std-Cell
Design Schematic Memory	Layout Memory	Characterize & Test Memory	QA & Release Memory
Design Schematic I/O	Layout I/O	Characterize & Test I/O	QA & Release I/O

IC DESIGN SERVICES

- **Provides a wide range of ready silicon-IP**
- **Full turnkey custom digital circuit design and layout services**
- **Build cutting edge Design/Verification soft IPs and offer SoC/IP design/verification services**

Thank you!