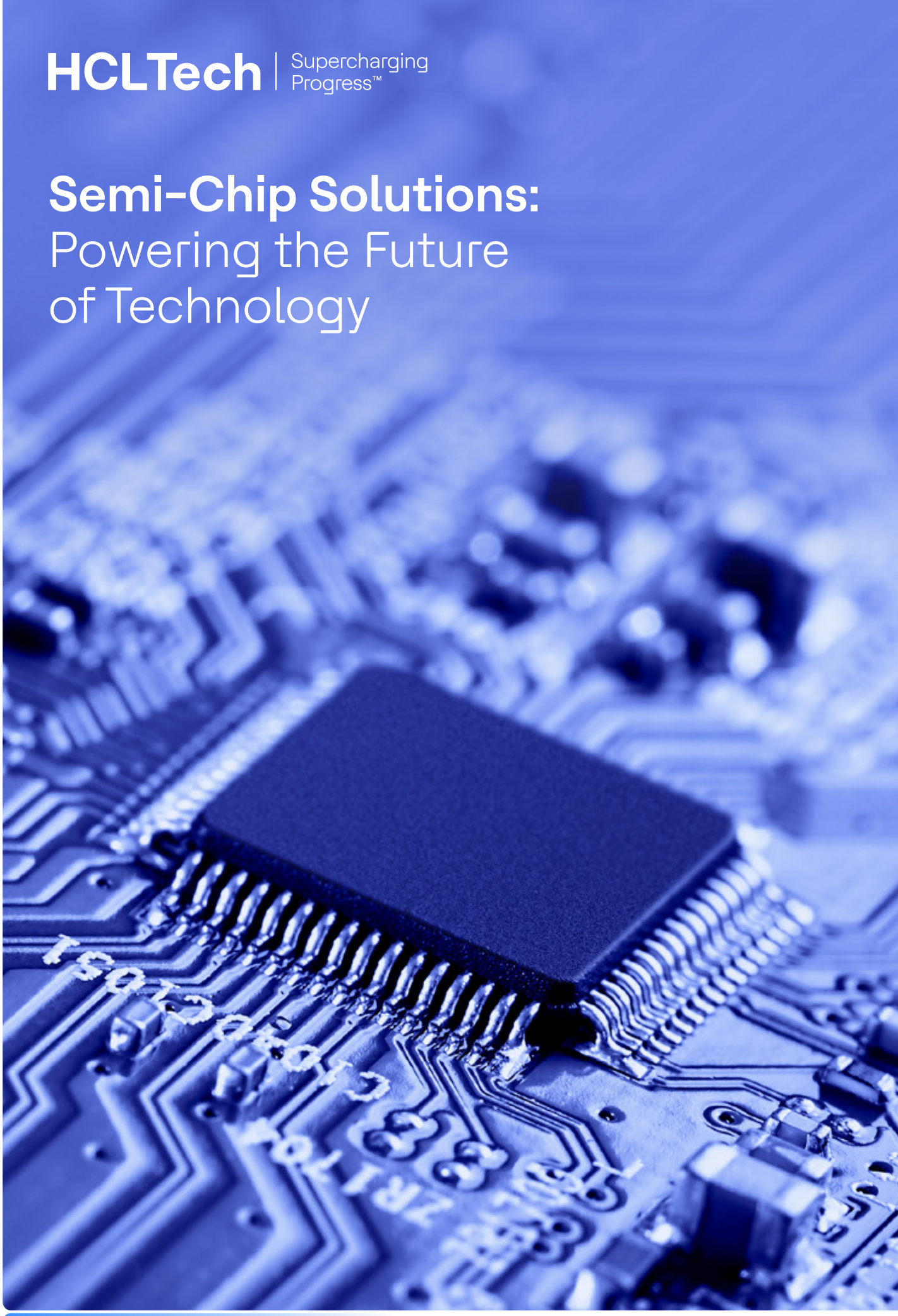
HCLTech | Supercharging Progress™

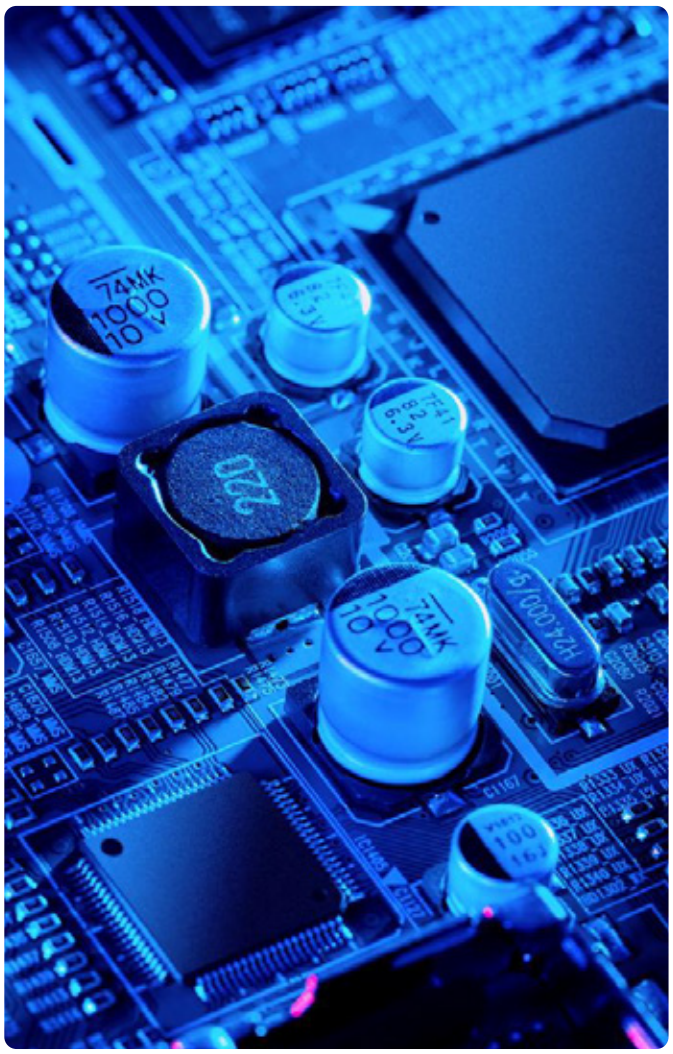
Semi-Chip Solutions: Powering the Future of Technology



Our Expertise

In today's digital age, semiconductors have become the bedrock of modern technology, permeating every aspect of our lives. The unique advantage offered by semiconductors reinforce their profound importance across industries. As we navigate an interconnected world driven by data, 5G, AI, IoT, robotics, smart devices, AR/VR and autonomous vehicles, the demand for innovative and customized Application Specific Integrated Circuits (ASICs) has reached unprecedented heights. Industries require High Performance Computing (HPC) and optimized networks in data centers to effectively manage the vast volumes of data being generated from AI, IoT, 5G and connected applications. Businesses need custom Integrated Circuits (ICs) to differentiate themselves from competitors and to optimize Power, Performance and Area (PPA) while managing product costs.

At HCLTech, we understand the critical role that custom SoC (ASICs) play in driving business growth and technological advancement. With our deep understanding and experience in the latest industry technologies including TSMC 5nm, 3nm and Intel IFS 18A, coupled with an unwavering commitment to excellence, we offer a comprehensive suite of services tailored to meet customer-'s' unique requirements in developing ICs for data centers, consumer electronics, automotive, medical, AI, IOT, 5G, robotics, immersive reality, media, networking and communication applications. From concept to manufacturing to the final product, we enable our customers through the entire semiconductor design flow, providing end-to-end solutions allowing them to stay ahead in this fast-paced digital landscape.



System on Chip (SoC) services lifecycle

HCLTech offers SoC (ASIC) development services in two phases and the production flow is as follows:

The first phase is front-end design service and prototype manufacturing, which includes the below;

Once the client verifies the sample, we will start the mass production phase, which includes the below;

Our comprehensive Silicon Lifecycle services

Our comprehensive suite of services spans the entire silicon lifecycle

Design Services

- Product architecture and microarchitecture
- RTL design
- Design verification
- Physical design and DFT

Manufacturing Services:

- Prototype and Risk Production:
- Manufacturing flow setup and maintenance
- Creation of Bill of Materials (BOM) and associated documentation
- Volume Manufacturing:
- Supplier base management
- Material monitoring and disposition
- Ongoing quality monitoring and reporting

Package Design Services

- Rout ability feasibility analysis
- PLOC – Pin/Ball-out definition and design
- Bonding diagram
- Substrate layout

Test Services

- Memory BIST
- Wafer sort testing
- Design probe card
- Sort test program
- Design load boards, sockets

Qualification Services:

Package Qualification Services:

- Temp. Cycle, HTSL, UHAST
- Generation of qualification reports

HTOL Qualification Service:

- Design, layout review, fabrication, and sockets for burn-in boards
- Development of burn-in vectors
- HTOL testing

Validation Services:

Pre-Silicon Validation Services:

- FPGA platform model builds
- FPGA platform enablement for validation and coverage

Process Corner Validation Services:

- Characterize corner units
- Development of process corner validation test program

Wake-up Validation and Functional Validation:

- Sanity checks
- SoC boot checks
- Additional Volume Validation:
- Improved functional validation coverage
- Repeatability tests/negative tests

Industries We Serve

- Automotive
- Aerospace and Defence
- Medical
- Consumer Electronics (Smart Devices)
- Cloud (Data Centre)
- Industrial IOT
- Communication (Networking, 5G)
- AI and Robotics
- Storage and Security
- Education and Research

World Class Lab Infrastructure

- $50M lab investments across 10+ Labs
- Labs across India and global locations
- 10K clean room for wafer testing
- Silicon qualification labs JEDEC 22 and AEC-Q100
- ISO/ IEC 17025 accredited laboratories

Pushing boundaries with our pioneering projects

Image Processing SoC for Mobile and IoT

- New image co-processor developed to work with application processor on a very tight schedule of 8 months
- Technology TSMC: 28nm and complexity 65M gates
- Tasks: - SoC integration, emulation, pre-silicon verification, DFT, physical design and post silicon validation
- First-time right delivery

Radar SoC for Autonomous Driving

- SoC for autonomous driving
- Technology: TSMC 16nm, Frequency: 2 GHz
- Complexity: 20M gates
- Flat chip with analog blocks
- 15+ Latest IPs integration in 50+ regions in floor planning

AI Edge Computing SoC

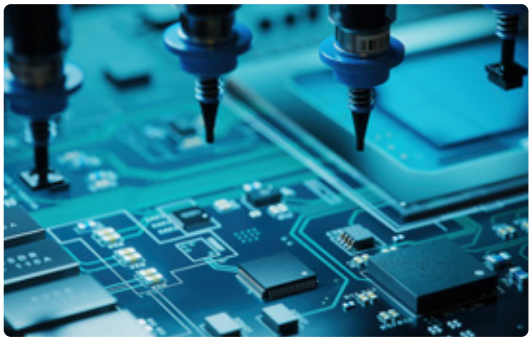
- AI SoC for edge inference based on compute in memory technology
- Technology: UMC 40nm CMOS Process
- Multicore ARM and analog IP integration
- Used HCLTech's existing reusable mixed-signal components to reduce the timeline by 15%

Falcon SoC (with AI)

- SoC built using ARM Cortex a 53 quad core and enabled with NVIDIA AI accelerator (open architecture).
- For deep learning inferencing applications.
- SoC enabled with low power features and design-for- debug (using ARM core sight subsystem)
- Integrated ARM processor subsystem, AI accelerator IP, interrupt controllers, low speed peripherals, SoC non-coherent fabric.

High Speed SerDes Testchip

- Technology: TSMC 16nm, frequency 10 Ghz
- Very high-speed interface IP
- Complete solution including test chip development, test board development and evaluation



Our leadership position in Silicon Engineering

26+
Years of silicon design services

3200+
employees across analog, digital and software design skills

200+
successful tape-outs across multiple- foundries/nodes

01

Key Differentiators

- Rich portfolio of solution accelerators, IPs and best practices
- Large investments in skills, methodologies, tools and ATMP infrastructure enabling "chip2 cloud" propositions and turnkey service offerings
- Successful partnerships with leading foundries and ecosystem partners
- Custom ASIC platform for DC,5G, IOT
- Managing foundries for X scalers

02

Solution Accelerators

- ARM and RISC-V based platform
- Proven methodologies/flows, automated tested and SoC Frameworks
- Silicon to cloud enablement accelerators

03

Benefits Delivered

- ARM platform reuse
- RSCV platform reuse
- Achieve a 20% increase in TTM Efficiency and 30% decrease in TCOS

Our semi-chip solutions are at the forefront of technological innovation, paving the way for a future driven by exceptional performance and efficiency. With cutting-edge design, advanced functionalities, and unparalleled reliability, HCLTech's semi-chip services powers next-generation electronic devices.

to know more about this and other customer sucess stories, please reach out to us.
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