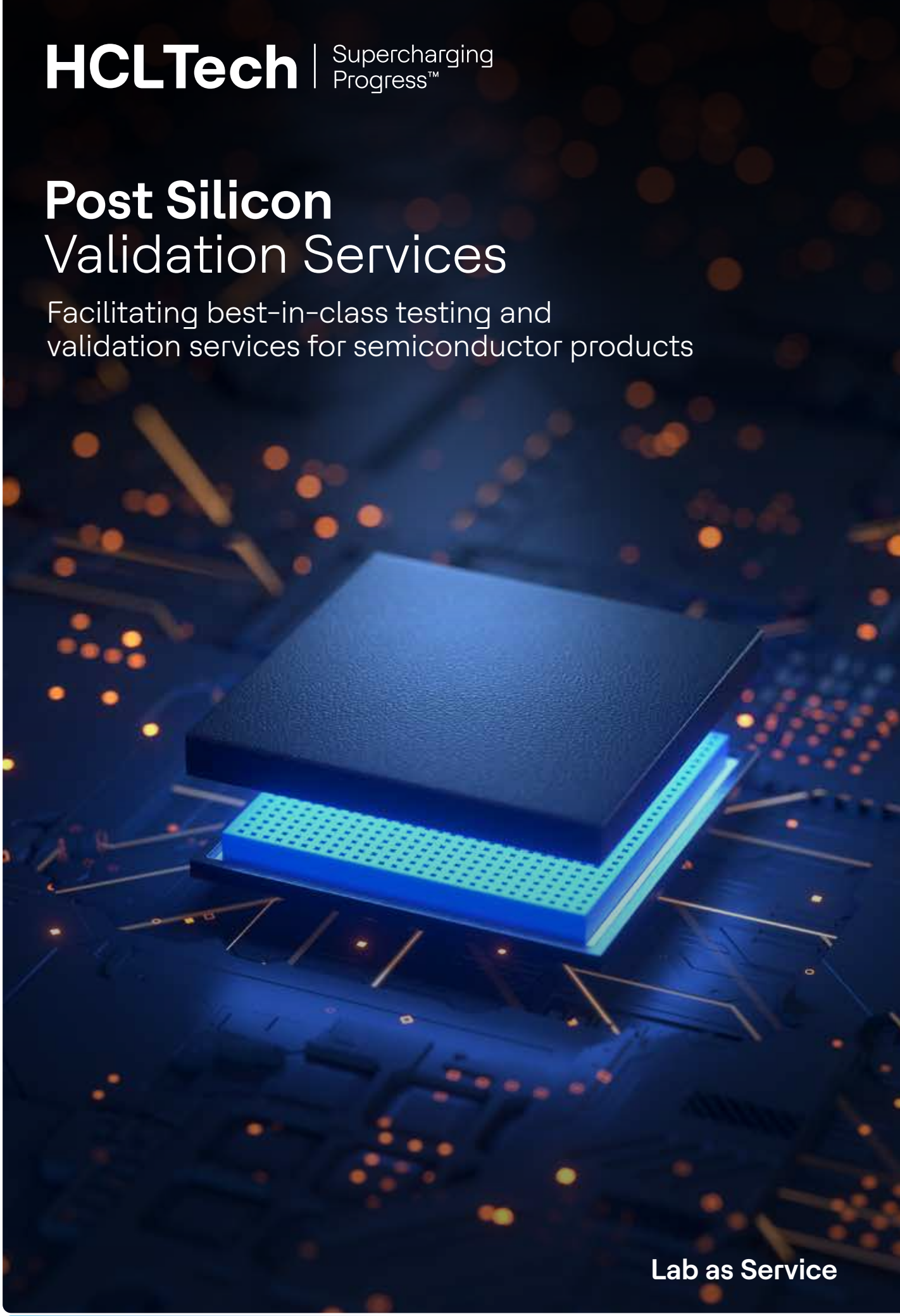
HCLTech | Supercharging Progress™

Post Silicon Validation Services

Facilitating best-in-class testing and validation services for semiconductor products



Lab as Service

Post Silicon Validation becomes extremely critical due to the increased complexity of System on a Chip (SoC) / ASICs, which limits the verification coverage provided by traditional pre-silicon methodologies. There is also an additional concern of integrating new technologies as this often requires interface -specific knowledge. With an increase in the number of high-speed interfaces every year, semiconductor and system design companies are facing an enormous challenge of validating these. For high-speed communication, comes with an intensive budget and there's an increased sensitivity to process, voltage, and temperature effects due to node shrink. These high-speed interfaces need to be characterized against extreme temperatures, supply voltages, and fast and slow process corners. Also, high speed interface faces performance issues due to impairments resulting from excessive jitter, Inter-Symbol Interference (ISI) effects, interference from clock and packaging problems. Most of the times, the equipment needed to support evolving technology may not be easily available or cost effective. There is also an additional responsibility on every product developer to ensure that this equipment meets a certain standard. But don't allow any of these to discourage you.

HCLTech's one-stop-shop testing and lab services provide solutions to shorten product development cycles and reduce costs.

Our one-stop-shop testing solution

Silicon Manufacturing Test

- Load board and probe cards design
- Test program development and conversion
- Test coverage analysis
- Package qualification
- Test program development across – Wafer Sort and Package Test

Silicon Design Validation

- Interface characterization:
  - Digital
  - ADC/DAC
  - PIMIC
  - RF devices
- Validation board design
- Silicon bring-up
- Diagnostics development
- PVT corner testing
- Protocol stress testing
- SerDes tuning
- Functional validation
- Platform validation
- Performance testing
- Regression / Stress Testing

We encompass the entire testing lifecycle

Electrical Compliance Testing

- PCCIe-Gen-5
- DDR-5, LPDDR-5
- USB 4.0.
- SAS-4, SATA-III
- Ethernet 25G, PAM 4
- Display port 1.4
- MIPI C-Phy. /D-Phy. /M-Phy.
- SFP/SFP+(10G)
- MIPI-I3C
- Automotive N/W interfaces (CAN FD, Automotive Ethernet and LIN)

Value Added Services

- Consulting and debug support
- Extended lab of customer
- Turnkey services
- 24x7 operation support

We have an extensive experience in product validation, starting from board/silicon bring up to final certification acquired from multiple system and silicon products, designed and delivered to varied customers over the past 35+ years. Our silicon validation expertise and infrastructure cover end-to-end solutions from DFT, packaging selection, functional, electrical and system level validation and high-volume production. Our experience in test engineering of low power/ high-speed silicon, including Digital, Analog and Memories, helps customers achieve improved efficiency and accuracy of fault diagnosis.

Our in-house infrastructure, equipped with state-of-the-art test equipment, will indeed speed up debugging and test deployment in the post-silicon phase.

We are amongst the first few companies in India to set up a complete product development environment and invest in EMI/EMC and Environmental and Durability Testing facilities. Our test facilities, ranging from semi-anechoic chamber and immunity test setups for EMC testing to vibration shaker and climatic chambers for climatic and durability testing, act as a one-stop shop for customers, helping them meet compliance requirements and reduce time to market and cost. We can run tests as per global standards and assist customers with certifications, including FCC and CE certification.

We have a dedicated antenna prototyping and testing facility. The Antenna lab is intended to characterize the performance of different antenna systems like radiation pattern characterization, S-parameters testing and antenna prototyping. RF Measurement Lab supports test and measurement of radio frequency, microwave circuits, modules and systems for various domains like consumer electronics, medical, aerospace, automotive and defense/military domains. With a vast capability in system/ silicon/ domain, we had set up a High-Speed Electrical Interface Validation Lab to provide affordable service to help customers in implementing high speed electrical interface and test such interfaces. We also help in removing the hurdles of the initial learning phase and provide a head-start to testing. We offer on-demand start and stop of scalable resources/test instruments and provide reusable test suite with higher test coverage.

Class 10K clean room with Testers

Thermal Controller/ Chiller -80 to 225° C

ESD Tester

Zebu Emulation Platform

Thermal Chamber

Thermostream

Package Qualification Testing & Reliability Testing Lab

We constantly upgrade our lab infrastructure and test solutions. We also have a dedicated engineering team which focuses on ensuring to have the necessary infrastructure to support the latest standards in the field. Currently our labs are equipped to support upto PCIe Gen-5, DDR-5, LPDDR-5, USB 4.0, SAS-4, SATA-III, 25G Ethernet, etc. We enable customers to precisely manage costs and achieve faster time to market using our lab and testing service solutions.

We are committed to delivering the best quality services and there's nothing more gratifying than seeing our customers trust us with their end-to-end engineering needs. We are a preferred supplier for the leading semiconductor companies providing end-to-end services across the semiconductor value chain. Make your product a success by working with the smartest minds. After all, with us, you test to get the best.

High Speed Scope

Tektronix-DPS77004S

RT – 70GHz/200GS/s

High Speed Scope

Keysight-DSAZ33A

RT – 33GHz/80GS/

BERT

Anritsu -MP1900A-E11300

PCIe 5/USB 4.0 / / SATA-3/ SAS-4/Display1.4/SFP/ Ethernet 25G

BERT

Anritsu -MP1900A-64G-E170

32G/64G NRZ/PAM4

BERT

Keysight-M8062A & M8020A

32Gb/s Front End Module PCIe-4/USB 3.2/SATA

Signal Analyzer

Keysight-N9020A – MXA

Signal Analyzer: 10 Hz to 26.5 GHz

Vector Network Analyzer

R&S -ZVA

VNA: 4 ports, 10MHz-67GHz

Vector Signal Generator

Keysight-N5182B

Vector signal generator – 9 KHz to 6 GHz

Arbitrary Waveform Generator

Tektronix-AWG70002

2-Channel: 10-bit: up to 25 Gs/s

Optical Spectrum Analyzer

Anritsu -MS9740A

32G/64G NRZ/PAM4

Wideband Scope

Keysight: N1000A DCA-X

90 GHz, Optical/EE TD OIF CEI 3.1, IEEE 802.3 (Ethernet), SFF-8431 (SFP+)

PNA – X series Network Analyzer

Keysight- N5244A PNA-X

Network Analyzer: 10 MHz to 43.5 GHz