

Dr. Nisha Prakash, Ph.D.

Semiconductor & Photonics R&D | III-Nitride Epitaxy & Thin Films | Photolithography | Quality & Reliability Leadership | NPI to High-Volume Manufacturing | AI-Driven Quality

Professional Summary

Semiconductor and photonics scientist and quality leader with a **Ph.D. in Engineering Sciences** and 11 years across semiconductor thin-film R&D, space and defence microelectronics, global process integration and high-volume consumer electronics manufacturing. Currently the **single DRI for Apple battery-pack quality in India**, owning quality from NPI to high-volume ramp, supplier and partner quality, critical-issue escalation and 8D/CAPA closure. Previously the **global subject matter expert for reliability and quality at First Solar**, resolving customer-raised issues end to end, and head of a thin-film division serving space and defence customers. I combine **semiconductor process and failure-analysis depth** with data-driven quality systems and AI-based inspection automation.

Skills

Quality & Reliability

Customer quality & escalations
8D / CAPA, 5-Why, Pareto, 5M+E
FMEA / PFMEA, control plans
SPC, Cpk, Gauge R&R
Reliability qualification, Weibull
Supplier audits (ISO auditor)

Semiconductor & Materials

Thin-film deposition, PA-MBE epitaxy
Photolithography & HMC devices
Device fabrication & characterization
SEM, XRD, AFM, ellipsometry
UV-Vis-NIR, photoconductivity
AOI & laser-weld inspection

Program, Data & Tools

NPI to high-volume ramp
Cross-functional leadership
DOE / ANOVA, ROC analysis
JMP, SAS, Power BI, Python
MATLAB, LabVIEW, Origin
AI & automation for quality

Work History

Manufacturing Quality Lead & NPI Program Owner

09/2025 – Present

Apple India | iPhone Battery Pack and Back Glass Assembly programs

- Single DRI for iPhone battery-pack quality in India (cell + BMU/PCM), owning quality from **NPI builds through high-volume ramp** with Apple engineering, operations and supply chain, FATP partners (Foxconn, Tata) and China counterparts.
- Head quality at **two battery vendor sites** whose quality teams report to me; govern supplier process quality through audits, failure analysis and **8D/CAPA closure**, including a formal CAPA after exposing a gap in a vendor's FA process.
- Lead critical-issue escalation and containment across vendors and FATP, driving root cause, risk assessment and corrective actions with cross-functional stakeholders.
- Directed conversion of an image-capture system into an **automated optical inspection (AOI) tool with OK/NG judgment**; it is now the shared defect standard across vendors, FATP and Apple teams.
- Developed an **ROC-based laser weld monitoring (LWM) method** that set data-driven pass/fail limits for battery tab welds.
- Lead cross-functional **automation and AI-based quality projects**. On back glass assembly, led dent, ding and scratch (DDS) yield improvement and out-of-box audits (OBA) with FATP teams.

Global Process Integration Engineer

09/2022 – 08/2025

First Solar India Ventures Pvt. Ltd., India | Promoted from Process Integration Engineer

- **Global subject matter expert** for reliability and quality processes, resolving **customer-raised issues** end to end; primary DRI for failure analysis on material- and laser-related issues.
- Led a cross-functional global team to redesign the quality assurance process using FMEA/PFMEA, raising the **qualification pass rate from 30% to 100% in six months**.
- Global consultant to plants in the US, Malaysia and Vietnam for new-technology implementation and new-plant qualification; transferred new technology from pilot line to satellite sites.
- Sustained key manufacturing metrics (yield, module efficiency, reliability and durability, cost) and led daily wattage and cascade-yield performance against the manufacturing plan.
- Partnered with development engineering, NPI, quality and reliability, MES and operations to qualify and implement process changes with full compliance.

Senior Scientist & Head of Department

06/2021 – 08/2022

Thin Films and Optics Division, Hind High Vacuum Company Pvt. Ltd., India

- Headed the **Hybrid Micro Circuits (HMC) laboratory**, including the ISRO-approved photolithography facility, leading **7 technical staff** and **6+ projects worth ~US\$1M in contract funding per year**.
- Delivered device fabrication, process development and characterization for space and defence customers, providing expertise in semiconductor materials, metrology, SPC and failure analysis.
- Worked directly with customers on requirements, quality assurance and compliance with military and space

standards, and identified future business opportunities.

- Improved product yield and cycle time to 90% within six months through structured improvement activities; promoted to Head of Department.

Research Fellow & Ph.D. Candidate

01/2014 – 02/2020

CSIR – National Physical Laboratory, New Delhi

- Grew III-Nitride thin films by **plasma-assisted MBE** and developed a UV hybrid photodetector for harsh environments and a broadband binary photodetector enabling photo-switching for optical communication.
- Co-executed a **US\$3.5M research project**; **10+ publications** in high-impact journals and conferences with **180+ citations** and a cumulative impact factor of 42+.
- Co-managed laboratory operations, materials and procurement, improving lab productivity by 70%.

Qualification

Ph.D., Engineering Sciences (AcSIR), 2020 | **M.Tech**, VLSI Design (C-DAC), 2009 | **B.Tech**, ECE, 2004

Recognition

Invited talks in Spain and the USA | Selected for a Caltech summer school | Peer reviewer, Springer Nature