

HIMANSHU GAUTAM

Hardware Engineer, Power Electronics and PCB Design

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SUMMARY

Hardware engineer working on mains powered switching supplies and battery charging boards for a German lighting and emergency power manufacturer. Covers active PFC, isolated GaN flyback, four switch buck boost charging, EMI and ESD input filtering, and multilayer Altium layout to IEC and DIN standards, plus ownership of the client's Altium libraries. Recent work extends into six layer impedance controlled carrier board layout with PCIe and RF for an embedded compute product. Has also taken an own design from blank schematic through to flown hardware.

EXPERIENCE

Hardware Engineer, Power Electronics and PCB Design

Gessler GmbH, Rodgau, Germany, contracted through PR Solution. Remote from India. Jul 2025 to Present

- Took mains input switching supplies, active CCM boost PFC feeding isolated GaN flyback stages, from schematic revision through multilayer Altium layout to fabrication release against IEC 61000-3-2 Class A and CE.
- Specified a custom flyback transformer with Würth Elektronik application engineers, then verified primary inductance, turns ratio, flux density margin and core and copper loss in Power Integrations PI Expert before release.
- Cut a 24 V rail drop to 1.2% after finding the specified common mode choke was rated 300 mA with 1.6 ohm DCR against a 1.5 A load, and replacing it with a 2 A, 0.19 ohm part.
- Designed the four switch synchronous buck boost power stage for a NiMH battery charging board across four hardware variants, choosing MOSFETs, inductor and Kelvin sensed shunts under a 0402 package limit.
- Built custom LTspice models and test benches, including a buck boost controller subcircuit, to check converter behaviour and inrush current before release.
- Embedded compute and connectivity board: laid out the power and RF sections of a six layer Rockchip RK3399 SOM carrier board on an impedance controlled stackup: point of load buck converters at 3.3 V, 5 V and 12 V, two RF paths to SMD SMA connectors for LTE and BLE, and the length matched PCIe differential pairs to the SSD. Closed schematic and component review comments through to release.
- Maintain the client's Altium libraries, wrote their symbol creation standard and output job templates, produce Draftsman drawings and production BOMs, and answer EMS partner DFM queries.

Electronics Team Head and Mentor, AKGEC Robotics Club

Ajay Kumar Garg Engineering College, Ghaziabad. Oct 2021 to Jun 2024

- Led the club's electronics team, running project scheduling and mentoring juniors through their first hardware builds.
- Sole electronics engineer on the pico satellite team that reached the finals of ISRO's CANSAT competition. Designed the complete PCB system from blank schematic through layout and fabrication, on a Teensy 4.1 with I2C and SPI sensors streaming temperature, altitude, pressure, orientation and GPS telemetry to a ground station. Brought up and validated the board, clearing a sensor crosstalk fault in the vibration heavy enclosure with board level shielding and rerouting. The satellite was launched and recovered successfully.
- Designed, built and tested the sensor subsystems and custom electronics for two autonomous robots that reached the finals of the ABU Asia Pacific Robot Contest, owning PCB layout, harness routing and connector selection.

SELECTED PROJECTS

Multi Output AC-DC Power Supply, 84 W (Gessler GmbH)

- Delivered 24 V at 3.5 A with 93% efficiency from a 90 to 264 VAC input across a six sheet schematic covering an active CCM boost PFC stage, a regulated 380 to 400 VDC bus, dual isolated GaN flyback converters and an isolated power line communication subsystem.
- Avoided a board respin by catching an overlap between the line overvoltage threshold and the regulated PFC bus during design review, then retuning the sensing divider before fabrication.

NiMH Battery Charging and Monitoring Board, 24 V Output (Gessler GmbH)

- Replaced centralised power supplies in luminaires with a 0402 constrained board giving a programmable 3 to 24 V output and 1 Wire UART host monitoring, to DIN EN 61347-2-7 across four variants.
- Kept 115200 baud signalling clean through the input choke by adding a 33 ohm series damper and a low capacitance ESD diode against ground bounce.

SKILLS

PCB Design: Altium Designer, up to 6 layer, mains and high voltage power layout, impedance controlled stackups, PCIe differential pair routing and length matching, RF connector launch and grounding, SOM carrier boards, creepage and clearance, thermal copper, library and symbol standards, Draftsman drawings, BOM generation, prototype assembly and board bring-up. KiCad, Eagle

Simulation: LTspice including custom subcircuits, PI Expert, PSpice, Cadence Virtuoso GPDK090

Power Electronics: Active PFC (CCM boost), isolated flyback SMPS, GaN InnoSwitch5-Pro, four switch buck boost battery charging, magnetics specification, EMI and ESD filtering, mains surge protection

Interfaces and Tools: I2C, SPI, UART, 1 Wire UART, PCIe, SD card, LTE and BLE integration, MCU and SOM integration (EFM8BB52, Teensy 4.1, Rockchip RK3399), sensor interfacing, Fusion 360

Standards: IEC 61000-3-2, IEC 61000-4-2, IEC 61000-4-4, DIN EN 61347-2-7, CE marking, DFM for European manufacturing

EDUCATION, PATENT AND AWARDS

B.Tech, Electronics and Communication Engineering, 2020 to 2024: Ajay Kumar Garg Engineering College, Ghaziabad, Dr. A.P.J. Abdul Kalam Technical University

Analog Layout Design Programme, 2024 to 2025: Pine Training Academy, Noida. Analog IC layout in Cadence Virtuoso on GPDK090, device matching and common centroid techniques, guard rings, DRC and LVS

Patent: Dual Axis Gyro Stabilized Atmospheric Data Acquisition Device, co-inventor. Indian Patent Application 202411051228 A, filed 4 Jul 2024

Awards: Finalist, CANSAT INDIA (ISRO and ASI). Two time Finalist, ABU Asia Pacific Robot Contest, IIT Delhi. Judge, World Robot Olympiad 2023

Work Authorisation: Indian national, eligible for the Irish Critical Skills Employment Permit. Electronics Engineer sits on Ireland's Critical Skills Occupations List, so no Labour Market Needs Test applies. 45 days notice