Tyler Richard

www.eedesignpro.com/contact

Education

University of California San Diego Graduated 2017

B.S. of Electrical Engineering - Focus in Power Electronics

Experience

BorgWarner, Inc. Jan 2022 - Present

Senior System Design Engineer *San Diego, CA*

- Design and test power systems from 1.5kW to 120kW
- Integrate modular AC/DC and DC/DC power modules into bidirectional EV charging systems
- Develop and debug prototype hardware, and document required rework and changes for future revisions
- Ensure hardware design meets UL requirements for rugged operation
- Design board and module level production test procedures and custom test equipment
- Qualify power converters to FCC and CISPR standards and automate EMI analysis with python and excel

General Atomics Aeronautical Systems, Inc. July 2017 – Jan 2022

Staff Electrical Design Engineer (Engineer IV) *Poway, CA*

- Designed and tested avionics electronics for military unmanned aerial vehicles
- Analyzed aircraft power generation, conversion, and distribution for 10kW+ 28VDC and 40kVA+ 115VAC systems
- Designed isolated and non-isolated power converters for power levels of 1W to 5kW+ for operation over extended temperature and altitude ranges
- Designed and qualified power and signal filters to meet MIL-STD-461 EMI/EMC requirements, and provide protection from DO-160 lightning and MIL-STD-704 power transients
- Ensured circuit designs met strict NAVMAT/NAVSO component deratings for high reliability
- Developed Python scripts for Monte Carlo error analysis, digital control loop IIR filter design, product test statistical analysis, and analog circuit optimization
- Developed Excel sheets for forced air cooling fluid dynamics analysis, Dowell's equations AC winding loss, aircraft power system distribution analysis, control loop stabilization, and EMI filter design

Consulting & Personal Projects Nights & Weekends, 2012 – Present

Electrical Design & Test Engineer *San Diego, CA*

- Designed, test, and manufacture an industrial 100W constant current LED driver with an precision 10mA to 20A output current range in a 4" x 4" x 2" package
- Perform power converter control loop stability analysis using an oscilloscope, tracking signal generator, and a custom signal isolation transformer
- Designed and fielded a fully automated test rack for a high performance battery operated radio module
- Designed and calibrated a 4.5 digit 2 channel DC power analyzer with an LED display and a PC com port
- Designed a hardware-in-the-loop I/O card to simulate the load and back-EMF of a stepper motor
- Built eight different high voltage vacuum tube guitar amplifiers with custom power and signal transformers

Yuneec USA Electric Aviation May 2016 - June 2017

Jr. Electrical Engineer & Technician *San Diego, CA*

- Tested and tuned HD video and control RF communications electronics
- Performed hardware troubleshooting for digital and RF circuits and performed necessary SMD rework

Technical Skills

Software: KiCad, PADS, LTspice, Magnetics & Electrostatics FEA, Excel, LaTeX, MS Office, Blender, Sketchup, Photoshop

Hands-on Electrical: SMD & THT soldering and rework, custom magnetics prototyping & assembly, PCB cleaning, conformal coating, cable & connector & LRU & test rack assembly, PLC wiring and troubleshooting

Electrical Test Equipment: Digital & analog oscilloscopes, logic analyzers, AC & DC power supplies, electronic loads, handheld & bench DMM's, signal generators, spectrum analyzers, network analyzers, lightning transient generators

Metalworking & Fabrication: Manual metal lathe & mill & drill press operation, MIG Welding, torch brazing, angle & pedestal & belt grinder operation, 3D printing

Programming: Python, Visual Basic, Embedded C/C++, GNU Octave

Hobbies: Electronics design, woodworking, hiking & backpacking, photography, cooking, acoustic & electric guitar