

John Ranson, P.E.

Consulting Electrical Engineer

585-851-8511 john@phaselead.com

SKILLS

- Board level design
- Analog, mixed-signal, power & low-noise design
- Rigid, flex, & HDI PCB development
- Hardware design for FPGAs & microcontrollers
- Motor controller design
- Schematic capture & PCB layout
- Low-level microcontroller firmware development
- Design for manufacturing and assembly
- Cable harness design
- Design for SI, PI, EMC & Regulatory certification
- Hardware prototyping, bring-up, & test
- EDA library & infrastructure development

CREDENTIALS

- Licensed Professional Engineer in MA & NY
- US Citizen

EXPERIENCE

Phase Lead Corporation & related

President and Principal Engineer

Westborough, MA and other locations

6/2016 - Present

- Operated a solo engineering consultancy, providing electrical engineering services with an industrial product development focus, from spec to working prototype and beyond
- Designs included complex multi-board projects:
 - Multiple generations of a specialized industrial camera with multi-channel picoampere-sensitive photodiode amplifiers, a low-noise thermo-electric cooler driver, motor drivers, FPGAs, MCUs and an SBC interface.
 - Power and flight control boards for an industrial drone, including high-current servo drives, hot swapping power, redundant batteries, & in-flight battery recharging from a generator.
 - HDI carrier and interface boards between a Kria SOM and an biotech ASIC including USB 3.0, PCIe, and Gigabit Ethernet with flyback isolated 802.3BT POE
 - GaN-based class-E inverter for an inductive RF plasma system.
- Offered consulting and incremental revisions on existing hardware for a wide variety of projects including EMC improvements, parts shortage fixes, obsolescence redesigns, etc.

908 Devices

Senior Electrical Engineer

Boston, MA

8/2014 - 6/2016

- Supported high pressure mass spectrometry product development with board level design, technology development, and science staff support.
- Designed a postage-stamp-sized HF inverter retrofit PCB to double a product's frequency capability with minimal impact to existing design.
- Designed a fast precision modulated HF ramp generator for an ion trap that produced outputs up to 1KV and 24MHz.
- Designed a thermal desorber board that included power conversion, heater drivers, fast precision temperature control, external serial interfaces, and valve drivers.
- Designed a scroll pump test and burn-in station that simultaneously tested up to 20 vacuum scroll pumps with DC brushless motors.
- Developed analog circuitry for Pirani gauges and gas detection cells.
- Eliminated USB issues in an existing product via eye diagram analysis and cable redesigns.

Finsix*Senior Electrical Engineer*

Boston, MA

9/2012 - 10/2013

- Developed a harmonic-balance based time-domain simulator in Python to rapidly optimize a multi-resonant HF switch-mode power supply. Designed, prototyped, and tested the circuit through several iterations.

Google*Hardware Engineer*

Mountain View, CA

7/2008 - 7/2010

- Developed schematics and supervised layout for a backplane with 10Gbps signaling and 20Tbps aggregate bandwidth. Devised a connection scheme that eliminated skew within differential pairs and minimized cross talk.
- Developed schematics and supervised layout for a network device with interlinked FPGAs, high speed memories and SERDES links to optical networking modules.
- Developed schematics for three different PowerPC based microcontroller subsystems used in networking PCBs.
- Debugged and developed workarounds for two IC issues traced to vendor silicon. Gathered data leading to vendor mask changes on a longstanding IC line.

MIT LEES & MIT RLE*Graduate Research Assistant**Undergraduate Researcher*

Cambridge, MA

9/2010 - 9/2012

7/2006 - 5/2007

- Developed an HF power converter using nonlinear capacitance to provide zero-voltage-switching. Characterized and modeled RF transistors

Draper Laboratory*Intern in Analog Design*

Cambridge, MA

5/2007 - 8/2007

- Developed a rad-hard circuit to stabilize an unstable open-loop power converter
- Proved a software root-cause for power transistor failures in a mixed signal system

Boston Dynamics*Electrical Engineering Intern*

Cambridge, MA

2/2006 - 8/2006

- Assisted in robot and OCU designs, assembly and maintenance

EDUCATION**Massachusetts Institute of Technology**

BSEE 2008, MSEE 2012

TOOLS

- Proficient with Altium Designer, SPICE, Polar Instruments, FAB3000, Footprint Expert, Python, NumPy, C/C++, Assembly, Git, Subversion, & Excel.
- Familiar with Perl, Matlab, SQL, & Verilog.
- Comfortable with Linux/Unix & Windows

OTHER**Interests and Activities**

Cooking, Home Preserving, Welding, Gardening