FT091897
Farita Tasnim

High Efficiency, Nanopower Voltage Step-Up Converter

Ordering Information

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Features

Massachusetts Institute of Technology
Major: Electrical Engineering
Class of 2019

Columbus High School
Valedictorian
Class of 2015

Maximum Ratings

PCB Design	●●●●●	Adobe Photoshop	●●●●
PCB Layout	●●●●●	Adobe Illustrator	●●●●
SolidWorks	●●●●	Autodesk Inventor	●●●●●
PTC Creo	●●●	Ham Radio	●●●●
C	●●●●●	Objective-C	●●●
Java	●●●●		

Electrical Characteristics

Electrical Engineering Intern, Intel Corporation, New Devices Group: June 2015 – Aug 2015: Created chips, firmware, and integrated product to harvest and analyze natural sources of energy from action sports to a) charge phone batteries and b) power sensors without the use of batteries, which drastically reduces form factor, maintenance, and market advantage.

Independent Research for Harvesting Ocean Wave Energy: Aug 2014 – May 2015, 730+ hours: Developed a novel adaptive energy harvesting system. Designed and debugged the mechanical structure along with a PCB, programmed in C. Device can calculate raw input energy of waves and convert the raw AC power from the generator into usable energy in one of three selectable modes: 1) battery charging, 2) electrolysis for hydrogen production, and 3) resistor load, and send the data via WiFi to a custom iPhone app.

Independent Research for Increased Solar Energy Harvesting Efficiency: Oct 2013 – present, 600+ hours: Achieved higher solar efficiency for solar panels in urban applications. Constructed a compact, novel solar site surveyor device (PCB, C firmware, and mechanical structure) that follows the sun as it moves across the sky and measures the solar current generated for any given spot. Device communicates via Bluetooth to an iPhone app I am developing to monitor and track the solar output of different locations, allowing for comparison and choosing the optimal placement of solar cells for highest return-on-investment.

FIRST and BEST Robotics: Jan 2012 – May 2015, 2,000+ hours: Captain of a team of 15-20 students. Program ran like a real engineering company. Created a 120-pound robot in 6 weeks in the spring and a 24-pound robot in 6 weeks in the fall. Instilled infallible work ethic and dedication in team members, ensured effective CAD design, wired the electronics, and wrote code in Java and C for sensor input, actuator control, vision processing, automated sequences, and joystick control. Passing down these skills to younger team members. Helped 4 students obtain Ham Radio licenses.

Independent Laboratory Construction: Constructed a microelectronics laboratory in my room in which I can design, manufacture, test, and debug professional caliber printed circuitboards. Made my own reflow soldering oven, fixed a broken $50 Tektronix 2440 oscilloscope, bought a boomscope.

Electrical Characteristics, cont.

DREAMS/NASA Space Program & High Altitude Balloon Program: Sep 2011 – May 2015, 1,100+ hours: Lead systems engineer of a team of 15-20 high school students. Sent payloads equipped with custom APRS trackers and data loggers over 100,000 feet into the atmosphere to obtain data of the of effect rising altitude in the Earth's atmosphere on several physical and biological phenomena. Prepared to launch a 10 cc. nano-satellite to gathers data on solar winds and sunspots for the NASA CubeSat program. Developed a custom, high precision (sub nT) flux gate magnetometer made with an amorphous metal core and its accompanying closed-loop instrumentation circuit which gathers data on core saturation and magnetic field using phase demodulation.

Non-Electrical Characteristics

Research Science Institute, Materials Science Approach for Increasing Solar Cell Efficiency: June 2014 – August 2014, 400 hours: Developed two novel, purely chemical procedures to coat titania nanotubes with iron oxide nanoparticles. Developed new solid-state solar cells with a higher electron diffusion coefficient down the nanotubes and 30% increased optical absorptivity.

Georgia Governor's Honor's Program, Mathematics: June 2013 – July 2013, 100 hours

Researcher at Auburn University Neuropharmacology Laboratory: Jan 2012 – Jan 2013, 300 hours: Conducted single channel electrophysiology on patch-clamp setups of AMPARs infused in artificial lipid bilayers. Discovered that AMPAR excitation was retarded by 70% due to presence of nicotine in prenatal stages. Concluded that upregulation of heteromeric nAChRs containing α4 and β2 subunits, which form most high-affinity nicotine binding sites in the brain, causes a decrease in AMPAR function as the agonist nicotine "tricks" the glutamatergic receptors into allowing it to bind.

Accolades

- Proton Onsite Energy Scholarship Winner
- Regional STAR Student
- FIRST Robotics Regionals, First Place Alliance Captain and Regional Winner
- NCWIT Awards for Aspirations in Computing National Runner Up and State Winner
- National Merit Scholar Semifinalist
- Math Prize for Girls
- Research Science Institute Scholar (3% acceptance rate)
- Georgia ARML Team
- MIT THINK: Ntl. Runner Up
- FLAG French Foreign Language Spoken Contest Perfect Score
- SAT Score of 2380 in 9th grade
- FIRST Robotics Rookie-All Star Award
- Georgia MATHCOUNTS, 1st Place Overall