Energy Made in Uganda

A Locally Manufacturable and Serviceable Solar Home System

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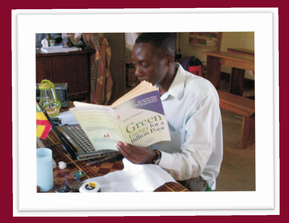
Social Impact

This Senior Design Project will serve as a useable and locally appropriate Solar Home System which will allow the end user to experience improved well-being, increased safety, greater productive hours, and increased access to education and trade. Additional micro-business can take off from community mobile phone charging.

A Sustainable Solution

Customer Information

EMIU, Mpigi, Uganda
Coordinator: Paola de Cecco



Ish

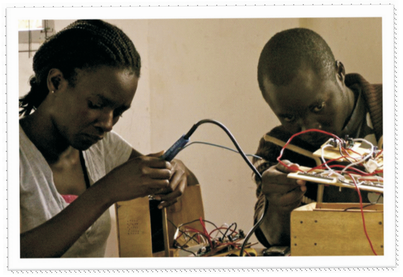
Promise

Joakim & Geoffrey

Future Stages in Design & Implementation

- Testing external conditions under all loads
- Sending system components to EMIU
- Teach Surface Mount Soldering Technique
- Include Manufacturing Plan
- Continuation:
  - –12 Volt System
  - –Casing Design

This project is a result of the collaboration between Santa Clara University and Energy Made in Uganda, a community-based organization in Mpigi, Uganda. Four Ugandan students trained in solar manufacturing, installation, and servicing, are continuing solar trainings at local Solar Technology Centers to manufacture Solar Home Systems which are sold in Ugandan communities. This method ensures that if a solar product breaks, there is a community representative available to service it. In partnership with these four students, this senior design project is to design the electronic system that is efficient, affordable, safe, serviceable, and that meets the end users' needs.

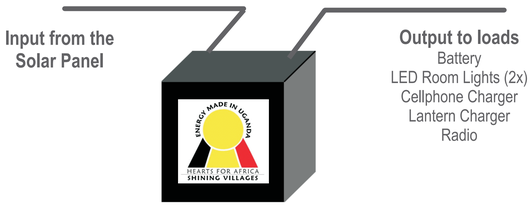


Students Soldering

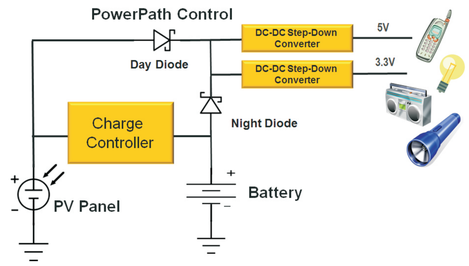
SolarTechnology Center

This research fosters deliberately community-centric involvement in eradicating energy poverty, focusing on developing human capacity in the form of transferrable skills attained from learning manufacturing, installation, and servicing of solar energy products. This provides employment opportunity and increased skills available in the community.

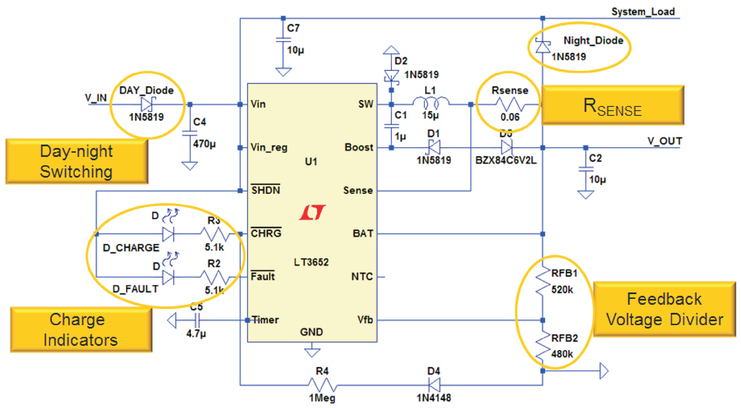
Product Specification



System Block Diagram



LT3652HV Charge Controller Schematic

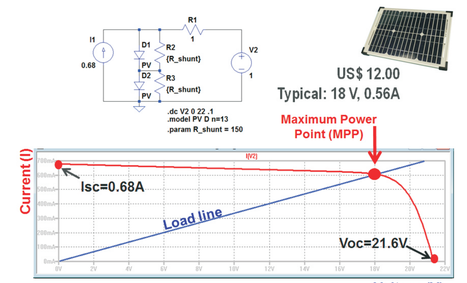


$R_{FB1} = (V_{BAT(FLT)} * 2.5 \cdot 10^5) / 3.3$

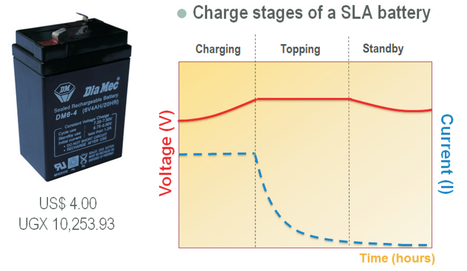
$R_{FB2} = (R_{FB1} * (2.5 * 10^5)) / (R_{FB1} - (2.5 * 10^5))$

Electrical Engineering, 2013

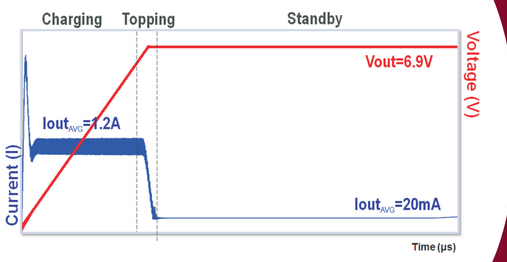
Solar Panel Characteristics



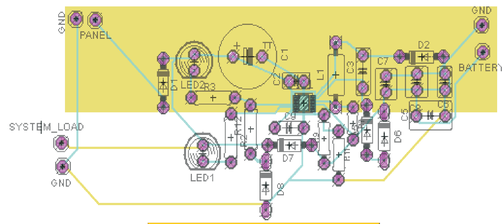
6V, 4Ah Sealed Lead Acid (SLA) Battery



6V Design Charging Cycle in LTSPICE



Printed Circuit Board Layout



$$v_{noise}(t) = Ltrace \frac{di(t)}{dt}$$