

Optimal power point tracking system for solar

The project aims at designing an optimal power point tracking system for solar. The system is capable of maximum energy from solar panel without any mechanical tracking towards sun.

Maximum Power Point Tracking, frequently referred to as MPPT, is an electronic system that operates the Photovoltaic (PV) modules in a manner that allows the modules to produce all the power they are capable of. MPPT is not a mechanical tracking system that “physically moves” the modules to make them point more directly at the sun. MPPT is a fully electronic system that varies the electrical operating point of the modules so that the modules are able to deliver maximum available power.

The main controlling device of the whole system is a Microcontroller. Solar panel, voltage sensor, LCD, and load are interfaced to Microcontroller. The Microcontroller initially measures the voltage from solar panel without load connected. Also, the Microcontroller measures the voltage from solar panel under load conditions. The microcontroller takes the decision of operating the load through PWM (Pulse Width Modulation) until the maximum voltage is obtained from solar panel without degrading the load performance. To perform this intelligent task, Microcontroller is loaded with an intelligent program written using embedded ‘C’ language.

The main objectives of the project are:

1. Bringing out maximum energy from solar panel without mechanical tracking.
2. PWM (Pulse Width Modulation) usage.

This project provides us with the learning’s on the following aspects:

1. MPPT techniques.
2. PWM operation of Microcontroller.

3. Solar panel working principle.
4. Embedded C programming.
5. PCB designing.

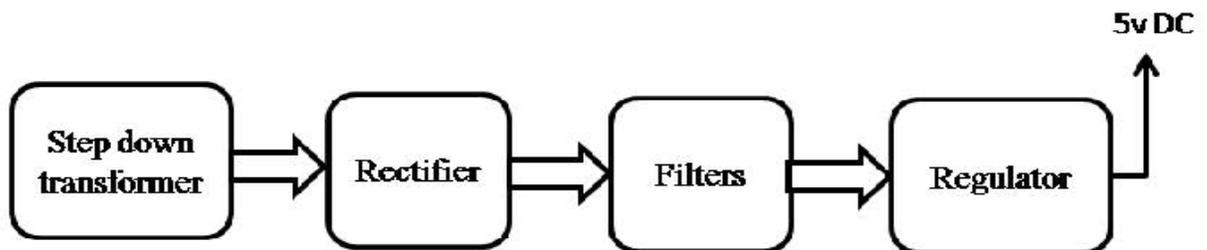
The major building blocks of this project are:

1. Regulated power supply.
2. Microcontroller.
3. Solar panel.
4. Voltage sensor.
5. Crystal oscillator.
6. Reset button.
7. LED Indicators.
8. LCD display with driver.

Software's used:

1. PIC-C compiler for Embedded C programming.
2. PIC kit 2 programmer for dumping code into Micro controller.
3. Express SCH for Circuit design.
4. Proteus for hardware simulation.

Regulated Power Supply:



Block diagram:

Maximum power point tracking

