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SOLAR TRACKING-AN OVERVIEW & CHARACTERIZATION

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ABSTRACT:

Sun Tracking System for Solar panel project is made to tracking the Sun at day time for using its solar energy appropriately for solar board. The Sun trackers are all climate, dependable and reasonable tracking and situating instruments. This project orients the Solar Panel toward the sun, so it can use with higher precision. Our Sun Tracker framework track the Sun by utilization of sensors and pivot the solar board by method for stepper motor. For level board applications, trackers are utilized to minimize the edge of occurrence between the approaching light and a solar board. This builds the measure of energy created from a settled measure of introduced power producing limit. The optics in concentrated solar applications acknowledges the direct part of sunlight light and thusly should be situated properly to gather energy. Tracking frameworks are found in all concentrator applications in light of the fact that such frameworks cannot deliver energy unless situated nearly toward the sun.

KEYWORDS: Solar panel, tracking system, solar cell, cell element, etc.

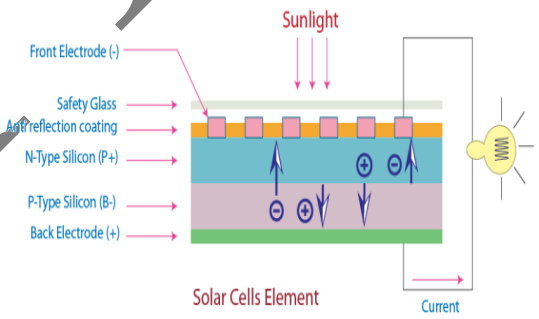
INTRODUCTION:

Fundamentally, Sunlight has two parts, the "direct beam" that conveys around 90% of the solar energy, and the "diffuse sunlight" that conveys the rest of the diffuse bit is the blue sky on a sunny morning and increments as an extent on overcast days. As most of the energy is in the direct beam, augmenting gathering requires the sun to be obvious to the boards to the extent that this would be possible. The energy contributed by the direct beam drops off with the cosine of the point between the approaching light and the board. Likewise, the reflectance (arrived at the midpoint of over all polarizations) is roughly consistent for angle of incidence up to around 50°, past which reflectance degrades rapidly.

Despite the fact that a settled level board can be set to gather a high extent of accessible early afternoon energy, noteworthy power is likewise accessible in the early mornings and late evenings when the misalignment with a settled board gets to be distinctly unnecessary to gather a sensible extent of the accessible energy. For instance, notwithstanding when the Sun is just 10° over the skyline the accessible energy can as of now associate with a large portion of the early afternoon energy levels (or considerably more prominent depending on scope, season, and climatic conditions). In this way the essential advantage of a tracking framework is to gather solar energy for the longest time of the day, and with the most precise arrangement as the Sun's position shifts with the seasons.

OPERATION OF SOLAR CELL:

A solar panel works by permitting photons, or particles of light, to thump electrons free from it as creating a stream of electricity. Solar boards really include numerous, littler units called photovoltaic cells. (Photovoltaic basically implies they change over sunlight into electricity.) Many cells connected together make up a solar board.



Each photovoltaic cell is essentially a sandwich made up of two cuts of semi-directing material, usually silicon - a similar stuff utilized as a part of microelectronics

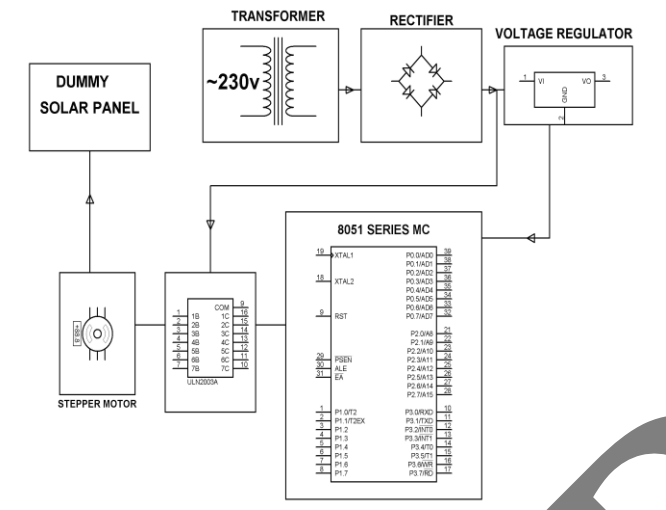
To work, photovoltaic cells need to build up an electric field. Much like a magnetic field, which happens due to inverse posts, an electric field happens when inverse charges are isolated. To get this field, makers "dope" silicon with different materials, giving every cut of the sandwich a positive or negative electrical charge.

In particular, they seed phosphorous into the top layer of silicon, which includes additional electrons, with a negative charge, to that layer. In the mean time, the base layer gets a measurement of boron, which brings about fewer electrons, or a positive charge. This all indicates an electric field at the intersection between the silicon layers. At that point, when a photon of sunlight thumps

an electron free, the electric field will push that electron out of the silicon intersection.

Several different parts of the cell transform these electrons into usable power. Metal conductive plates on the sides of the cell gather the electrons and exchange them to wires. By then, the electrons can stream like some other wellspring of electricity.

BLOCK DIAGRAM:



DESIGN CONCEPT:

The project utilizes a solar board connected to a stepper motor to track the Sun so most extreme sun light is episode upon the board at any given time of the day. This is better contrasted with light detecting technique that may not be exact dependably for instance amid overcast days.

With the looming shortage of nonrenewable assets, individuals are thinking about to utilize exchange wellsprings of energy. From all other accessible assets sun energy is the most plenteous and it's nearly simple to change over it to electrical energy. Utilization of solar board to change over sun's energy to electrical is exceptionally main stream, yet because of move of the Sun from east to west the settled solar board might have the capacity to produce ideal energy. The proposed framework takes care of the issue by a course of action for the solar board to track the Sun.

This following development is accomplished by coupling a stepper motor to the solar board with the end goal that the board keeps up its face constantly opposite to the Sun to produce most extreme energy. This is accomplished by utilizing a programmed microcontroller to stepped pulses in periodical time interims for the stepper motor to turn the mounted board as craved. The microcontroller utilized as a part of this venture is from 8051 family. The stepper motor is driven by an interfacing IC as the controller is not equipped for taking care of the power necessities of the stepper motor. The venture is given a sham solar board which can be utilized for showing reason as it were.

Advance the venture can be upgraded by utilizing RTC (Real Time Clock) to take after the Sun. This is to keep the required position of the board regardless of the possibility that the power is hindered for quite a while.

CONCLUSSION:

It can be presumed that till the time 12 noon, when the sun achieves precisely overhead, the energy levels are not essentially extraordinary in following now and again conditions yet after 12 noon, critical contrast in levels can be seen in the accomplished qualities. This is the time when the solar tracker assumes a vital part in extricating more energy than it would have without following. A normal rate increment of roughly 18% in the power yield can be seen. power output are gotten from a second rate solar cell and minor blunders in the control frameworks, with the utilization of a high review solar cell and complex hardware, power output can be enhanced and higher increment.

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