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**List Of Abbreviations:**

LDR- Light Dependent Resistor

LCD- Liquid Crystal Display

BJT- Bipolar Junction Transistor

IDE- Integrated Development Environment

MOS- Metal Oxide Semiconductor

IO- Input Output

PCB- Printed Circuit Board

OLED- Organic Light Emitting Diode

InGaN- Indium Gallium Nitride

AlGaInP- Aluminium Gallium Indium Phosphide

AlGaAs- Aluminium Gallium Arsenide

PTFE- PolyTeraFluoroEthylene

SMT- Surface Mounted Technology

A.K.A.- Also Known As

CPU- Central Processing Unit

OS- Operating System

FPGA- Field Programmable Gate Arrays

EDA- Electronic Devices and Applications

DXP- Design Explorer

**ABSTRACT**

Solar irradiation is a green and sustainable renewable energy source which is largely harnessed through photovoltaic and thermal cell surfaces. It is one of the fastest growing clean power technologies with high-global growth figures, due to its simplicity, affordability and abundant availability. Solar power systems is one of the fastest growing interventions augmenting fossil power and its application is now expanding beyond domestic utilization to commercial and industrial dependence. Due to continuous change in the position of the sun together with other salient factors, only a fraction of the suns energy potential is harnessed. The paper is focused on sharing an optimization option that has effectively addressed a major gap experienced in conventional solar power system installation as applicable to light emitting diodes traffic light systems. The continuous movement of the sun limits maximum sun light irradiation absorption and solar trackers are practical solutions to this drawback. The high cost of solar trackers has however been the major limitation to their adoption. The Introduction of microcontroller-based solar tracking systems using Arduino board was found to be cost effective, and it improved the efficiency of the solar cells significantly. In the study, the maximum power point tracking algorithm was designed and developed using multiple-axis servo-motor feedback tracking system, which increased the efficiency of the solar panel array by 23.95%.