# SRI RAMAKRISHNA INSTITUTE OF TECHNOLOGY

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## DESIGN OF A SEPIC CONVERTER FOR SOLAR PV SYSTEM


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## SYNOPSIS


Solar energy is one of the most important renewable energy sources since it is pollution free, clean and abundant in nature. Single Ended Primary Inductor Converter (SEPIC) performance is investigated in this proposed work for boosting up the Solar PV power. Though it acts like a buck-boost and cuk DC-DC converter, it has some unique features over the other two types like non inverted output, providing low switching stress on semiconductor switches, etc. It allows a wide range of variable DC voltage as input and maintains a constant DC output voltage. The efficiency of the converter is improved by the coupled inductor since it needs only less amount of magnetic core. In this work, SEPIC converter performance has been compared with the buck-boost converter for validating the high gain features of SEPIC converter. Maximum Power Point Tracking (MPPT) technique is also used to enhance the solar PV output voltage by tracking the maximum power point continuously which depends on the plant irradiance conditions. The capability of tracking Maximum power point has been verified experimentally with a 24W solar panel under a controlled setup. The performance of the SEPIC converter and buck-boost converter has been simulated using MATLAB/ Simulink software and the responses compared. The hardware prototype for SEPIC converter was developed and investigated based on the simulation design. The practical implementations of this system will definitely improve the conversion efficiency and utilize more power from solar PV system.