

## **Abstract**

Due to the uncertainty associated with available solar radiation, a solar PV module naturally cannot supply power at constant output voltage. The performance of a battery is significantly improved in terms of durability and load delivering capability, provided the specified charging conditions, viz, constant voltage or constant current condition, are maintained. In this work a regulating circuit has been designed which can regulate the output voltage of a solar module for using in battery charging applications. The circuit is primarily based on the adjustable voltage regulator chip LM315 and zener diodes. This circuit provides auto cut-off facility by disconnecting the battery from the solar module once the battery is fully charged. It can also protect the battery from being discharged beyond the set level.

A control circuit for automatic operation of the street light, i.e. auto power on/off, is also designed and attached to the charging circuit. The circuit is based on the LDR and a microcontroller. The function of this circuit is to continuously monitor the available natural light and compare that level with the preset level for switching the street light on or off depending on the comparison result. This circuit can assure unwanted drainage of the battery and can thus preserve the converted solar energy in the battery for appropriate use or most essential condition. The circuit can also be suitably extended to operate an array of street lights such that only minimum number of street lights is switched on depending on the requirement.