

## ABSTRACT

A lot of heat are produced from machines which up to now are not used optimally. For example is a machine that converts chemical energy to a mechanical energy which produces heat which is wasted trough exhaust pipe. Thermoelectric generator can be a potential solution for this problem. It can convert heat into electricity which can be used to other utilities. The main problem is low efficiency of thermoelectrics. There are a lot of factors which affect the output voltage and current such as the difference of temperature and Seebeck coefficient of thermoelectric material. Up to now, there are a lot of attempt to search for good thermoelectric material. In order to check the output of thermoelectric module, I built a characterization set up which can control temperature, measure output voltage and display Seebeck coefficient. It consists some components such as power supply, high temperature generator, low temperature generator, temperature sensors, arduino mega, and liquid crystal display. The set up was used to test TEG1-241-1.4-1.2 thermoelectric modules in single, serial and parallel circuit configuration. Voltage and current output are observed to gradually change with temperature changes whereas the Seebeck coefficient is not always linierly changed with temperature changes. The Seebeck coefficient varies from 0,032 V/°C up to 0,045 V/°C when different themperature is chaged from 25°C up to 65°C. Serial circuit produces higher voltage while parallel circuit produces higher current. Both serial and parallel circuits are very influenced by thermal resistance and electrical resistance. In case of many TEG modul configuration, technical problem related to temperature homogeneity distribution strongly influences the output voltage and current.

Keyword: *thermoelectric, difference of temperature, electric*