

Optimization of Pole Numbers and Rotor Size for a Single Phase Slot-Less Permanent Magnet Generator.

ABSTRACT

This paper discussed on the optimization of a permanent magnet generator (PMG). Generally, the PMG is a slot-less type topology, operated in a single-phase, and it was developed to energize the linear motor in pruner application. Due to this application, a compact generator that can produce up to 100W output power is required since the overall size of the PMG is important. Permeance Analysis Method (PAM) is used to analyzed the PMG performance characteristic. Finite Element Method (FEM) and measurement of the PMG prototype were used to verify the PAM result. Various numbers of poles and rotor size were considered during this analysis. The results show that the slot-less PMG with stator size of 104 mm will produce maximum power of 110 W when it has 6-poles with rotor radius is 37 mm. Based on the results, the calculation method using PAM shows good agreement with measurement and FEM simulation.

Keyword: Generator; Permanent Magnet; Permeance; Pole number; Slot-less