

# Permanent Magnet Reluctance Generator

## Maintenance and rare metal free generator



### Overview

This invention is for a permanent magnet reluctance generator (PMRG) employing the ferrite magnet instead of the rare-earth magnet, which has almost the same output power and efficiency in comparison with the one employed rare-earth magnet in spite of lower cost.

The optimum shape for the rotor pole-tip was designed to reduce torque ripple, which enables noiseless running.

### Product Application

- Water turbine generation
- Wind turbine generation
- Ultrahigh-speed generation (e.g. Micro gas turbine)

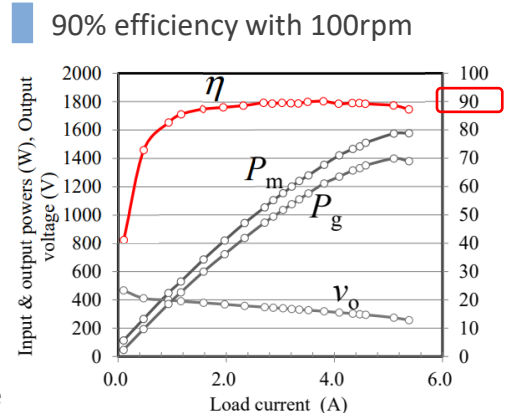
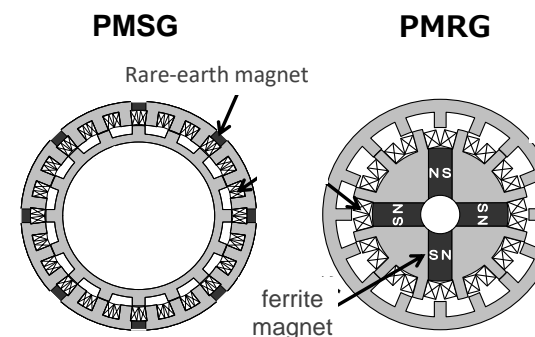
### Related Works

- [1] K.Nakamura et. al(2010)., Stator-Permanent-Magnet Reluctance Generator using Ferrite Magnet for Small-Scale Renewable Energy Generation
- [2] K.nakamura et. Al(2012)., Super-multipolar permanent magnet reluctance generator designed for small-scale wind-turbine generation

### IP Data

IP No. : US9,018,815, CN200980158702.X, JP5413919  
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 Admin No. : T08-080

### Features · Outstandings



Hired outer-rotor style and but ferrite magnet into dead space inside

Generator	Power density	Efficiency	Direct drive	Self-sustaining generation	Mainten ance	Generator cost
IG	○	○	×	×	○	◎
DFIG	○	◎	×	×	△	○
FWSG	○	○	△	×	△	◎
RG	△	△	○	×	○	◎
PMSG	◎	◎	○	○	○	×
PMRG	○	◎	○	○	○	○

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