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# Journal of Electrical Engineering and Electronic Technology


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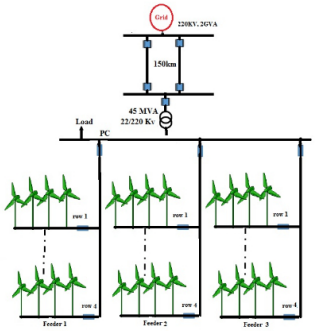


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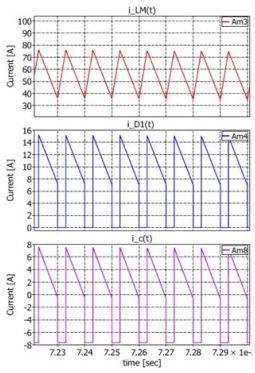


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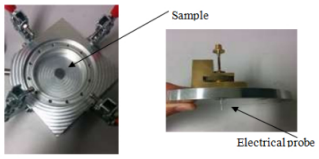


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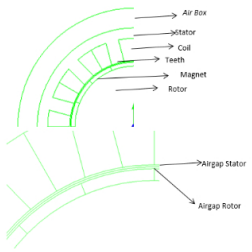


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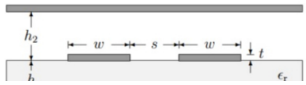


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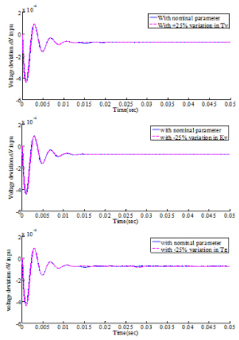

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Research Article, J Electr Eng Electron Technol Vol: 7 Issue: 2

# Effect of Geometry Generator Variation Design 12 Slot 8 Pole on Power Efficiency Design

**Windarto J***, **Sudjadi, Karnoto, Sukmadi T, Santoso I and Desmiarti A**

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**Received:** May 25, 2018 **Accepted:** June 12, 2018 **Published:** June 19, 2018

**Citation:** *Windarto J, Sudjadi, Karnoto, Sukmadi T, Santoso I, et al. (2018) Effect of Geometry Generator Variation Design 12 Slot 8 Pole on Power Efficiency Design. J Electr Eng Electron Technol 7:2. doi: 10.4172/2325-9833.1000161*

## Abstract

The development of generator technology continues to improve from year to year. The scope of such improvement varies from the shape, design, size, the usage of material, and even regarding to the efficiency of the generator output power. However, the role of the software to design such electric machinery in the improvement of generator technology development should not be ignored. So before designing and manufacturing the electric machines, especially generators, it is important to know the specifications of materials which are needed in the design of the generator, regarding the initialization of each constituent part of the generator for example, in the pre-design process of a 12 slot 8 pole generator is a must.

Keywords: Output power; Input power; Efficiency



## Introduction

The development of generator technology continues to improve from year to year. The scope of such improvement varies from the shape, design, size, the usage of material, and even regarding to the efficiency of the generator output power. However, the role of the software to design such electric machinery in the improvement of generator technology development should not be ignored. So before designing and manufacturing the electric machines, especially generators, it is important to know the specifications of materials which are needed in the design of the generator, regarding the initialization of each constituent part of the generator. Therefore, it is expected that further research could be able to provide such information regarding the materials needed to build the generator. Many prior researches and studies used Trial and Error methods, especially here in Indonesia. The method in other words means to directly work on the building process of the generator that has been designed mathematically. This is based on the assertions made for example, the geometric design which is used. Then came the idea of designing a generator with the help of software, such as, Magnet to create the simulation of the generator. While manufacturing or designing a generator, one must determine the ideal efficiency value of the generator so as to be able to reach the desired target value. In designing a generator using electromagnetic software, such as Infolytica, there are many aspects that need to be considered, either before or during the design process. It's because many parameters use equations which needs to be calculated when designing the generator [1-5]. The width of the air gap is one of the parameters that uses equation because the air gap will later affect the output and performance of the generator.

## Modeling and Simulation

**Pre design 12 slot 8 pole generator**

The design drawing is the stage to draw the geometric shapes of the stator, rotor, slot, air gap width, and determining the appropriate magnet layout so that it will produce a good sinusoidal signal. Design drawings can be done directly using software such as Magnet Infolityca, as well as CAD software, Solid work, Inventor and AutoCAD. **Figures 1** and **2** shows a generator design made using Infolityca software.

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# Microwave Characterization of Silicon Carbide Sample at the ISM Band from 25°C to 165°C

**Rammal W[1], Rammal J[2*], Salameh F[2], Taoubi M[1], Fouany J[3], Alchaddoud A[4] and Canale L[4]**

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**Received:** June 25, 2018 **Accepted:** July 10, 2018 **Published:** July 17, 2018

**Citation:** *Rammal W, Rammal J, Salameh F, Taoubi M, Fouany J, et al. (2018) Microwave Characterization of Silicon Carbide Sample at the ISM Band from 25°C to 165°C. J Electr Eng Electron Technol 7:2. doi: 10.4172/2325-9833.1000160*

## Abstract

This article presents a microwave characterization at the ISM band (2.45 GHz) for the dielectric properties of a Silicon Carbide sample with high loss tangent from 25°C to 165°C. Different techniques were used to characterize the SiC sample: the cylindrical resonant cavity technique in transmission and reflection mode, the microstrip ring resonator and finally the near field microwave microscopy. The results obtained by the cylindrical resonant cavity (transmissionand reflection) are in good agreement, the relative permittivity and the loss tangent of the SiC increase with temperature by 48% and 190% respectively between 25°C and 165°C. These techniques are accurate but need two thermal cycles. The results obtained by the microstrip ring resonator are less accurate than the resonant cavity and the low quality factor (Q0=2.5) does not allow to correctly determine the imaginary part of the permittivity and consequently, the loss tangent. Finally, the near field microwave microscopy technique shows an accurate measurement with low uncertainties in the real (<2%) and imaginary part (<5%) of the permittivity. These results are in good agreement with the resonant cavity techniques, however this technique needs just one thermal cycle which allows saving time during the measurements.

**Keywords:** SiC; Temperatures; Characterization; ISM; Uncertainty; Techniques; Microwave

Journal of Electrical Engineering and Electronic Technology.

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Research Article, J Electr Eng Electron Technol Vol: 7 Issue: 2

# Smart Over Speed Protection of Zafarana Grid-connected Wind Farm during Wind Gust Conditions

**Mohamed MA Mahfouz[1*] and Mohamed El-Sayed AH[2]**

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**Received:** April 07, 2018 **Accepted:** June 25, 2018 **Published:** June 29, 2018

**Citation:** *Mahfouz MMA, El-Sayed AHM (2018) Smart Over Speed Protection of Zafarana Grid-connected Wind Farm during Wind Gust Conditions. J Electr Eng Electron Technol 7:2. doi: 10.4172/2325-9833.1000158*

## Abstract

The increasing share of renewable energy in electricity generation requires an effective operation and protection scheme using Smart Grid (SG) technologies. Smart meters of SG allow the transfer of the measured signals in the wind farm to the operation and protection centre of the SG. Such signals transmission can improve the farm performance and reduce system cost. The secure operation of wind farms requires an efficient over speed protection of the turbines under wind gust conditions. Therefore, this paper is concerned with integration of a new over speed protection algorithm with the existing protection centre in SG. The main objective of the proposed algorithm is the dynamic updating of Critical Clearing Time (CCT) for over speed protective relays against severe wind gusts to minimize loss of life and component damage. In this respect, long-term data of wind speed of Zafarana farm have been collected and processed to define gust intensity and its distribution Moreover, the geographical farm area is classified to different rows according to the recorded gust values. A smart relay setting will be formulated by developing heuristic algorithm, which relates CCT with the gust intensity, and its row along the geographical area of Zafarana farm. Accordingly, general two variables second order function will propose to identify the dynamic CCT based on wind speed measured by smart meters installed on each wind farm row. The digital relay settings are updated according to the determined CCT using the communication facilities existing in the SG. The simulation results indicate that the proposed over speed protection improves significantly the performance of the grid connected wind farm under wind gust conditions.

**Keywords:** Renewable energy; Wind farm grid connected over speed protection; Smart digital relay