DESIGN RESONANT TRANSFORMER

by

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APPROVAL AND DECLARATION SHEET

This project report titled Design Resonant Transformer was prepared and submitted by Mohd Faisal Bin Ibrahim (Matrix Number: 071070448) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Industrial Electronic Engineering) in Universiti Malaysia Perlis (UniMAP)

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REKA BENTUK PENGUBAH RESONAN

ABSTRAK

Projek ini bertujuan untuk mereka bentuk sebuah pengubah resonani. Sebuah pengubah resonansi pada dasarnya adalah suatu alat statik elektromagnet berdasarkan prinsip undang-undang Faraday tentang induksi elektromagnetik yang dapat menghasilkan tegangan bolak-balik dan arus yang tinggi. Merujuk kepada resonansi, voltan yang sangat tinggi dapat dibina melalui bahagian sekunder, sehingga sampai ke tahap limitnya oleh beberapa proses seperti gangguan elektrik. Berdasarkan pengetahuan tentang prinsip asas pengubah, pengubah resonan ini dibuat dengan mengunakan kapasiti 2.0KVA. Lilitan pengubah adalah masing-masing 182 lilitan primer dan 3636 lilitan sekunder. Ia dirancang sebagai 100V voltan primer dan 2000 voltan sekunder. Kumparan resonansi, biasanya kedua, bertindak sebagai induktor, dan disambungkan dalam keadaan siri dengan kapasitor. Bila kumparan primer didorong oleh sumber arus bolak berkala, seperti persegi atau gelombang pada frekuensi resonansi, setiap denyut arus membantu untuk membina sebuah ayunan di kumparan sekunder.

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ABSTRACT

This project aims to design a resonant transformer. A resonant transformer is basically an electromagnetic static equipment based on the principle of Faraday's law of electromagnetic induction that can be generate high alternating voltages and current. Due to resonance, a very high voltage can develop across the secondary, until it is limited by some process such as electrical breakdown. Based on knowledge of basic principle of transformer, that rated capacity of resonant transformer is design with 2.0KVA. The winding of transformer is 182 primary turns and 3636 secondary turns respectively. It designed as 100V of primary voltage and 2000V of secondary voltage. The resonant coil, usually the secondary, acts as an inductor, and are connected in series with a capacitor. When the primary coil is driven by a periodic source of alternating current, such as a square or wave at the resonant frequency, each pulse of current helps to build up an oscillation in the secondary coil.

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B	Magnetic flux (t)
N	Numbers of turns
F	Frequency supply (Hz)
A	Cross sectional area of sample strips (m^2)
cosθ	Power factor
Voc	Voltage in open circuit
Poc	Power in open circuit
η	Efficiency
Vp	Primary voltage
Vs	Secondary voltage
Vsc	Short circuit voltage
Isc	Short circuit current
Psc	Short circuit power
Y_E	Admittance
P_{in}	Input power
R_{eq}	Equivalent resistor
EMF	Electromotive force
Bm	Flux Density
Ag	Gross Core Area
mA	Milliampere
sq mm	Square millimeter
kVA	Kilo Volt Ampere
mm	Milimeter (Unit of length)