THE STUDY OF VOLTAGE-CURRENT (V-I) CHARACTERISTIC OF LIGHTNING IMPULSE TO THE MODELLING OF METAL-OXIDE VARISTOR (MOV)

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DECLARATION SHEET

I hereby declare that my Final Year Project Thesis is the result of my research work under supervision of Mr. Azralmukmin B. Azmi. All literature sources used for the writing of this thesis have been adequately referenced.

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APPROVAL AND DECLARATION SHEET

This project report titled The Study of Voltage-Current Characteristic of Lightning Impulse to the Metal-Oxide Varistor was prepared and submitted by LIM HOOI HOON (Matrix Number: 071090325) and has been found satisfactory in terms of scope, quality and presentation as partial fulfillment of the requirement for the Bachelor of Engineering (Electrical Systems Engineering) in Universiti Malaysia Perlis (UniMAP).

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LIST OF SYMBOLS, ABBREVIATIONS OR NOMENCLATURE

SPD	Surge Protective Device
MOV	Metal-Oxide Varistor
V-I	Voltage-Current
PSIM	Powersim
MDF	Magnetic Direction Finding
TOA	Time-of-Arrival
VDR	Voltage Dependent Resistor
ZnO	Zinc Oxide
R	Resistor
L	Inductor
C	Capacitor
V	Volt
A	Ampere
Ω	Ohm
H	Henry
F	Farad
μ	micro
m	mili
M	Mega
s	Second

Kajian Atas Varistor Logam Oksida (MOV) Terhadap Gelombang Dedenyut

ABSTRAK

Projek ini adalah kajian ke atas varistor logam oksida (MOV) terhadap gelombang dedenyut untuk mengkaji ciri-ciri voltan-arus oleh MOV. MOV banyak digunakan dalam peralatan voltan rendah untuk perlindungan daripada gelombang dedenyut yang sentiasa berlaku semasa petir dan mengalir dalam saluran penghantaran ke peralatan voltan rendah. Dalam projek ini, gelombang dedenyut arus digunakan untuk menguji kemampuan MOV dengan arus yang besar. Selain itu, MOV daripada pengilang 'Littlefuse' telah dipilih. Untuk menjayakan projek ini, kajian atas gelombang dedenyut arus dan ciri-ciri voltan-arus bagi MOV adalah penting. Di samping itu, perisian PSIM telah digunakan dalam pemodelan dan ujian. Dari hasil simulasi, bandingan atas ciri-ciri voltan-arus bagi MOV dapat diperolehi.

The Study of Voltage-Current (V-I) Characteristic of Lightning Impulse to the Metal-Oxide Varistor (MOV)

ABSTRACT

This project studies the voltage-current (V-I) characteristic of lightning impulse to the metal-oxide varistor (MOV). MOV is widely used in the low voltage equipment for protection from lightning surge. This surge, produce an extra current which will propagates from transmission line along to the low voltage equipment. From this project, lightning impulse current is injected to the designed modelling of MOV to test its capability to withstand the surge current. In this project, MOV of manufacturer 'Littlefuse' is selected. In order to familiar with the project, study on behaviour of lightning impulse and V-I characteristic of MOV is vital. Powersim (PSIM) software has been used in modelling and testing. From the simulation, comparison of V-I characteristic is obtained.