

SURGE PROTECTION FOR SENSITIVE EQUIPMENT

**This report is presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Hons)
Universiti Teknologi MARA**



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ACKNOWLEDGEMENT

By the name of Allah, the beneficent, the merciful. First and most importantly, I would like to thank my supervisor, En Mohd. Khayat bin Idris, for his guidance and invaluable advice throughout the preparation and completion of this project. Also I would like all the laboratory personnel for their cooperation. A special thanks to En. Ismail bin Musirin and En. Ngah Ramzi for their invaluable advice to run this project.

Secondly, I would like to express my sincere gratitude and heartfelt thanks to my beloved parent, En Aladin bin Wan Nordin and for their guidance and love in naturing me to be who I am today.

Last but not least, I would to thank all my friends especially to my housemate for their support and encouragement throughout the study.

May Allah bless you all.

ABSTRACT

This paper presents the surge protection for so-called sensitive equipment. The scope involved the testing of Metal Oxide Varistor (MOV) and diode suppressor to investigate the device reliability clamping action by injecting a high voltage impulse from Heafely Surge Tester. Beside that, an impulse voltage generator was developed to emulate the small-scale voltage spike that could be detected in normal computers and telephone line. The design had achieved 126.4V negative impulse with $2\mu\text{s}$ rise time. This signal had been used to test the capability of MOV.

CHAPTER ONE

INTRODUCTION

1.1 Introduction

Electrical surge is an unwanted signal that normally interrupts most electrical equipment including computers, modem, medical instrumentation and other equipment that involve data transfer. Since the phenomena had become an important issue in our daily activities, therefore it has to come out with proper protection device in order to overcome the problem. There are few protection devices available in the market including surge arrestor and diode suppressor.

Modern electronic equipment is increasingly relaying on high-density semiconductor components, which inevitably results in very thin internal circuit traces and much closer spacing. The natural environment, on the other hand, retains its ability to deliver lightning strikes with undiminished strength and frequency. This is needed to keep mega joule energy source (lightning) from damaging micro joule sensitive IC's.

Transient voltages have a variety of sources, the most obvious and potentially disastrous being a lightning strike. Should a building experience a direct hit then even well shielded structures are likely to see large voltages induced into power and data lines by a variety of mechanism[1].

Previous work carried out by Mohd. Rizal Abdullah had indicated that the lightning suppressor could be developed using MOV[2]. The magnitude of voltage spike that can be suppressed is dependent upon devices rating capability.