

**POWER FACTOR AND THD IMPROVEMENT USING PSIM  
SOFTWARE**

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## **ABSTRACT**

This project describes power factor correction using passive PFC and active PFC. Both techniques were simulated using power simulation software (PSIM). Passive filter was firstly tested but it did not give the proper result. Active PFC using buck converter was finally chosen and the result showed optimum power factor and minimum THD.

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# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND OF STUDY

Power Factor is an important performance parameter of a system. Improving power factor is very much essential for the better and economical performance of the system. If the power factor of a system at a given power requirement is poor, then large value of Volt – Amperes or large amount of current is required by the system which is drawn from the supply. This report is a research on the power factor improvement at input side in electrical system. There are two methods that will be used which using passive power factor corrector and active power factor corrector. In passive PFC, an inductor is parallel with capacitor is placed between voltage source and diode bridge rectifier. This filter will filter out the harmonic current and in the mean time it will increase the power factor in electrical system. The input current of a rectifier consist of large discontinuous peak current and it will produce current of harmonic at input side. The value of inductor need sufficiently large for store enough energy to maintain the rectifiers in conduction for the half cycle. The passive PFC circuit only can carry until 400W. If the rating power is greater than 400W the active PFC circuit is necessary. However, the series inductor has disadvantages due the losses occur due to resistance of inductor, the load voltage become lower due to voltage drop and the resonance that produce from filter capacitor. Generally, the passive PFC improves the power factor in electrical system and reduces the harmonic currents but it does not eradicate the problem completely. In active PFC, it is usually used in electrical system for large power consumption. It can improve power factor efficiently