

**MIDDLE EAST TECHNICAL UNIVERSITY**

**Electrical and Electronics Engineering Department**

**EE-464**

**Static Power Conversion-II**

**HARDWARE PROJECT**

***“ISOLATED DC-DC CONVERTER”***

**Team Members:**

**Zeynep Çöklü**

**Zehra Güneş 2232023**

**Tuğçe Şevval Kaya**

**Ecem Karamercan**

**1. Introduction**

Electrical connection between in the input and output side is known as a strong disadvantage in current technology since the grounded input is also presented in the output side. To solve this common problem, a transformer is provided as it is able to separate the output from the input side electrically so that an isolated DC stage is obtained. In this hardware project, the main objective is to design an isolated DC-DC converter with closed loop control mechanism.

The given limitations and specifications are provided for this design as follows:

* **Minimum Input Voltage**: 24 V
* **Maximum Input Voltage**: 48 V
* **Output Voltage**: 15 V
* **Output Power**: 45 W
* **Output Voltage Peak-to-Peak Ripple**: 3%
* **Line Regulation**(Deviation of percent output voltage when input voltage is changed from its minimum to maximum or vice versa): 3%
* **Load Regulation**(Deviation of percent output voltage when load current is changed from 10% to 100% or vice versa): 3%

Knowing all of these, the report consists of the following parts: a topology selection among the isolated converters was made considering their advantages and disadvantages. Then, analytical calculations were provided based on the theoretical background of the topology. Deciding the values for the necessary parameters, the computer simulations were also given. The rest of the report contains the component selections including the magnetic design phase as well.

**2. Topology Selection**