# Introduction

Nowadays, electric vehicle technology is a rising trend and Tesla is leading this technological leap. In Tesla Model S, there are two battery, high and low voltage ones, and there is a connection between them. The problem is that their voltage levels are so different, and it is needed to design a converter between them. At this point, Martian Power Solutions introduce a solution for this problem. Specs of the project are listed below, and the rest of the report contains the topology selection, some theoretical calculations, component selection including the magnetic core design step and the realistic simulation results are mentioned in detail. Also, schematic of the design is shown that will be used in the PCB design process.

* **Minimum Input Voltage:** 220 V
* **Maximum Input Voltage:** 400 V
* **Output Voltage:** 12 V
* **Output Power:** 100 W
* **Output Voltage Peak-to-Peak Ripple:** 4%
* **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%

Thanks to this project, we as engineers of Martian Power Solutions will improve our engineering skills. Moreover, we have a chance to use theoretical knowledge that we have learned in EE464 course.