# Analytical Calculations

It is decided to use three phase diode rectifier to convert AC voltage to DC. Average output voltage of the three phase diode rectifier can be found as:

Then the average output voltage of the rectifier is equal to the input voltage of the buck converter, . And the output coltage of the buck converter is:

Where D is the duty cycle. To satify the project conditions, is equal to 180V. And to work safe and efficient, maximum value of the duty cycle is 80%. Because are ignored nonidealities such as commutation effect.

To give 225V to buck converter, 96.19 V rms should be supplied to rectifier.