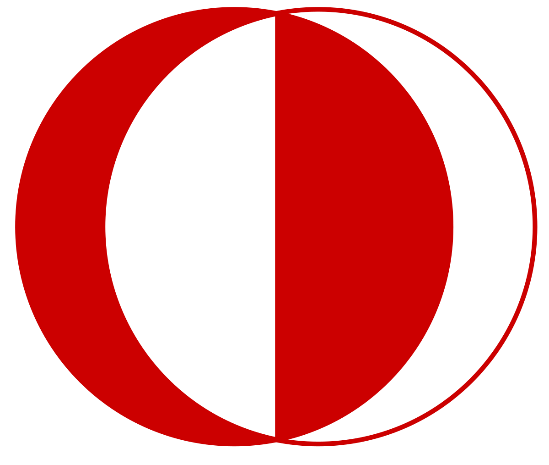
# **EE463 STATIC POWER CONVERSION-I**

# **TERM PROJECT SIMULATION REPORT**



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# **Thermal Calculations**

## **Switching Losses and Conduction Losses:**

Our design consists of 7 diodes and 1 IGBT as semiconductors. 6 of the diodes is in the three-phase rectifier module, 1 of them is used as a freewheeling diode buck converter and also, IGBT is used as a switch in the buck converter.

**-Switching Loss formula (Reverse Recovery Loss):**

**-Conduction Loss Formula**

Three-phase rectifier module VUO36-16NO8 [1] consist of 6 diodes. For these diodes, let’s do the loss calculations:

(Maximum voltage that rectifier diodes will block) (buck converterin duty cycle’I edge’lere yakin olmamasi icin line-line voltage boyle olmali)

(In our case, reverse current will be smaller since Vreverse = 135 V)

(Operation Frequency)

(Not written in the datasheet)

Hence, for these diodes, switching losses can be ignored.

(Maximum current that passes through a diode in our design)

For the freewheeling diode, we are planning to implement DSEP30-06B [2] to the buck converter. For this diode, let’s do the loss calculations:

(Maximum voltage of the motor that diode will block)

(In our case, reverse current will be smaller since Vreverse = 180 V)

(Operation Frequency)

(Written in the datasheet)

We can say that switching loss is very low.

(Maximum current that passes through this diode in our design)