**Magnetic Design**

In order to design magnetic design, first the area product is calculated.

To have a realistic core model fill factor is chosen as 0.05. According to the research, frequency of 67kHz is the most used frequency for flyback converter, it might be said that 67kHz is the standard. After calculating the area product, available component list is checked and 0P43434EC is chosen. Then sample circuits are investigated in Texas Instruments web page. For flyback converter UC3842 is the most used current mode controller, therefore we decided to use that integrated chip.

Diagram

Description automatically generated

Figure xx: Sample Flyback Converter Circuit with UC3842

In this circuit the magnetizing inductance of primary side is calculated as 42uH and 47uH is decided to be used to have less current ripple. Then minimum number of turns is calculated to not to saturate the core.

Number of turns is chosen as 1.375 then;

These values are the minimum number of turns for primary and secondary.

In order to achieve 47uH, there should be some airgap in the core. To find the airgap, one should obtain the required air reluctance.

In order to have meaningful air gap AL is chosen as 400nH.

Also

Considering an A4 paper, this airgap value corresponds about 2 A4 paper width. After airgap calculations, number of turns is calculated to achieve 47uH magnetizing inductance.