Inductor Flux Density Calculation

$l_e := 5.2\ cm$ $A_e := .46 \cdot cm^2$

$\mu_i := 125 \cdot \mu_0$ $A_L := 135 \cdot 10^{-9}\ H$

FairRite 5961000501 example core

$E_{Lrms} := 20\ V$ $N := 5$ $f := 1\ MHz$

Inductor variables

$$I_{Lrms} := \frac{E_{Lrms}}{2\ \pi \cdot f \cdot N^2 \cdot A_L} = 0.943\ A$$

Resulting inductor current

$$B_1 := \frac{E_{Lrms}}{\sqrt{2} \cdot \pi \cdot A_e \cdot N \cdot f} = 195.721\ gauss$$

B calculated from voltage

$$B_2 := \mu_i \cdot \frac{N \cdot \sqrt{2} \cdot I_{Lrms}}{l_e} = 201.455\ gauss$$

B calculated from current