Flyback ACDC Transformer Design Tool
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Parameter Settings

Flyback Voltage
$VOR := 115$

$$VOR := 115 \tag{1}$$

The peak of AC Input minimum Voltage whih 20 % margin
$VinMin := 85 \cdot 1.4 \cdot 0.8$

$$VinMin := 95.20 \tag{2}$$

The peak of AC Input maximum Voltage with 20 % margin
$VinMax := 265 \cdot 1.4 \cdot 1.2$

$$VinMax := 445.20 \tag{3}$$

DC Output Voltage
$Vout := 3.3$

$$Vout := 3.3 \tag{4}$$

The maximum DC Output Current in A with 20 % margin in consideration of overload protection point
$Iomax := 0.22 \cdot 1.2$

$$Iomax := 0.264 \tag{5}$$

The Voltage Drop on the DC Output Diode
$VF := 0.7$

$$VF := 0.7 \tag{6}$$

Oscillator Frequency in Hz
$fswmax := 132 \cdot 10^3$

$$fswmax := 132000 \tag{7}$$

Magnetic Flux Density (T)
$Bsat := 0.35$

$$Bsat := 0.35 \tag{8}$$

Effective magnetic cross section in mm^2
$Ae := 12.1$

$$Ae := 12.1 \tag{9}$$

Inductance factor in nH/$turns^2$, the ALcould be adjusted by using the Air Gap of core
$ALvalue := 178.5$

$$ALvalue := 178.5 \tag{10}$$

The ABSOLUTE maximum rating of DRAIN Voltage
$Vds := 700$

$$Vds := 700 \tag{11}$$

The ABSOLUTE maximum rating of Ippk with 20 % margin. According to the LNK363's datasheet should not *exceed* 195 *mA* and not *exceed* 700 V
$Ippkmax := 195 \cdot 0.8$

$$Ippkmax := 156.0 \tag{12}$$

Ls in uH which is measured by uing the prototype
$Lsm := \frac{14.32}{9} \cdot 8$

$$Lsm := 12.72888889 \tag{13}$$

Summary for Lp in uH, Np and Ns in turns

$Lp \cdot 10^6$

$$9730.525816 \tag{29}$$

Np

$$233.4796558 \tag{30}$$

Ns

$$8.121031506 \tag{31}$$

More Parameters for VOR in Voltage, Ls in uH, Ispk in A, Ippk in A, NI in A · turns

VOR

$$115 \tag{32}$$

$NptoNs$

$$28.75000000 \tag{33}$$

$DutyMax$

$$0.5470980019 \tag{34}$$

$Ls \cdot 10^6$

$$11.77228076 \tag{35}$$

$Ispk$

$$1.165815126 \tag{36}$$

$Ippk$

$$0.04055009134 \tag{37}$$

NI

$$9.467621369 \tag{38}$$

Design Requirements

1. *Flyback voltage VOR*
Vin(Max)+VOR should less than Vds. The Vds (The ABSOLUTE maximum rating of DRAIN Voltage)
if $Vds > (VinMax + VOR)$ **then** $print($ *The design could work!* $)$ **else** $print($ *ERROR! ! ! !The design failed!* $)$ **end if**

$$\text{\textit{The design could work!}} \tag{39}$$

2. Secondary winding inductance Ls and secondary side maximum current Ispk
Ls in uH which is measured by uing the prototype (Lsm) should less than the Ls which had been calculated in the section 2
if $Lsm < Ls \cdot 10^6$ **then** $print($ *The design could work!* $)$ **else** $print($ *ERROR! ! ! !The design failed!* $)$ **end if**

$$\text{\textit{The design could work!}} \tag{40}$$

3. *Primary winding inductance Lp $\cdot$ (H)* and *primary side maximum current Ippk $\cdot$ (A)*
The Ippk should **not** exceed *the* ABSOLUTE maximum rating of Ippk with 20 % margin.
if $Ippk \cdot 10^3 < Ippkmax$ **then** $print($ *The design could work!* $)$ **else** $print($ *ERROR! ! ! !The design failed!* $)$ **end if**

$$\text{\textit{The design could work!}} \tag{41}$$

4. *Primary winding number Np*
if $Np > Npmin$ **then** $print($ *The design could work!* $)$ **else** $print($ *ERROR! ! ! !The design failed!* $)$ **end if**

$$\text{\textit{The design could work!}} \tag{42}$$