Dear TI people or other very nice helping guys,

For a 1-10V fluorescent lamp dimmer I've selected this device make a flyback converter to power a simple MCU and a few other components. Besides minimal no load power, small size is an important design parameter as well.
I would like to refer to the latest datasheet of this part: "SLUSBE8A –MAY 2013–REVISED JANUARY 2014"

It would be nice (if you intent to help me) that I do get my questions answered, because now I'm stuck on THESE THINGS and not other things. THESE THINGS are the situations when you see a question mark while READING this message. Sorry I have to say this but I experience so often useless responses.

I would like to make the circuit that is shown in the DESIGN PROCEDURE section of the datasheet, and adjust the component values tailored for my application. I'll show here as well:

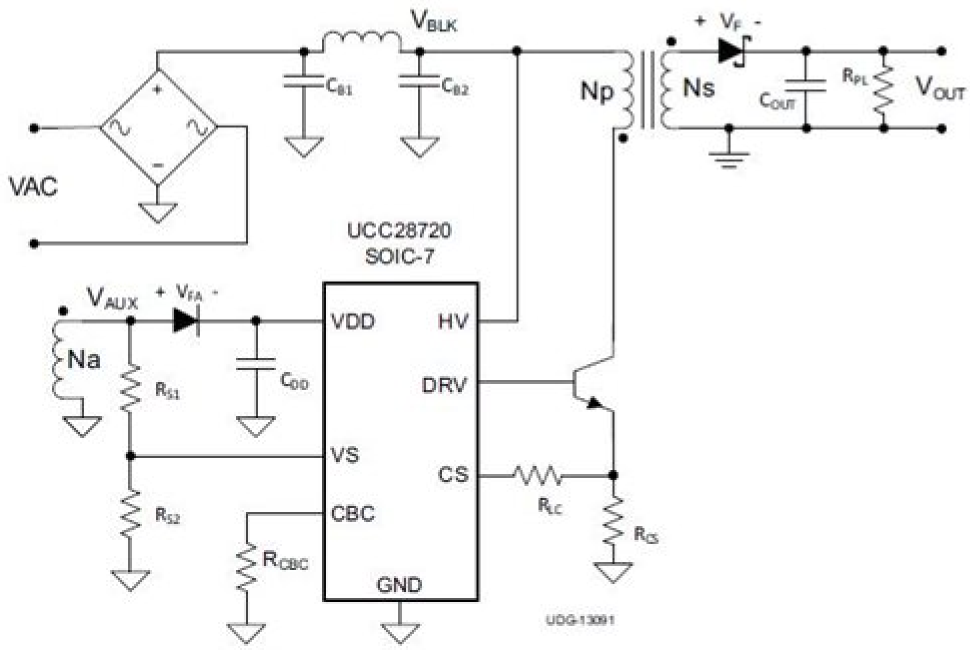


Figure 20. Design Procedure Application Example

So I attempt to work out the full design procedure. Everything fine until I get to the transformer (coupled inductors for flyback) part on page 20.

$$D_{MAX} = 1 - \left(\frac{t_R}{2} \times f_{MAX}\right) - D_{MAGCC}$$

tR = 2u, fMax = 74 kHz, DMAGCC = 0.425
So DMAX = 0.501

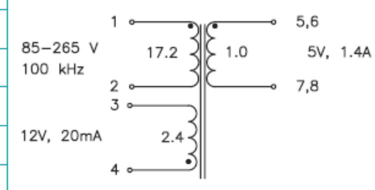
$$N_{PS(max)} = \frac{D_{MAX} \times V_{BULK(min)}}{D_{MAGCC} \times (V_{OCV} + V_F + V_{OCBC})}$$

VINMIN = 230V -15% = 230 * 0.85 = 195.5
VBULKMIN = VINMIN * sqrt(2) * 0.8 = 221.2 V, the 0.8 is for 20% ripple on bulk capacitor.
VOCV = 5V
VF = 310 mV
VOCBC = 0, I don't use this

Nps(max) = 49.1, that is pretty large

I was thinking about this one from Pulse Electronics

PA3965.002NL	Pri. Inductance	(1-2)	680μH ±15%
		(1-2)	544μH Min @ 0.7A
	Lk. Inductance	(1-2) with (3,4,5,8) shorted	15μH MAX
	DCR	(1-2)	1870mΩ MAX
		(3-4)	290mΩ MAX
		(5-8)	250mΩ MAX
	Hi-Pot	Pri-Sec	5000Vrms



DCM FLYBACK TRANSFORMER

So my Nps = 17.2

Rather than continuing with the selection of RCS value I realized I already also defined the primary inductance with the selection of this transformer.
Lp = 544 uH

This is a significant lower inductance compared to the one I get with the equations.

I use the equation below to calculate the peak primary current.

$$L_P = \frac{2(V_{OCV} + V_F + V_{OCBC}) \times I_{OCC}}{\eta_{XFMR} \times I_{PP(max)}^2 \times f_{MAX}}$$

η_{XFMR} = 0.9, they said it was a good approximation
IPP(max) = 242 mA

So for my very small output power it is fine to use a lower inductance on the primary and allow the peak current to be higher, is it?

$$I_{PP(max)} = \frac{V_{CST(max)}}{R_{CS}}$$

VCST(max) = 735 mV
RCS = 3.0 ohm, standard e24

I'm not completely certain about the verification of the minimum on time, should the calculated value be higher OR lower than the 300 ns specification? And what do I need to use for VCST(min) the min, typ or max specification? And VCST(max)?

$V_{CST(max)}$	Max CS threshold voltage	V_{VS} = 3.7 V	735	780	815	mV
$V_{CST(min)}$	Min CS threshold voltage	V_{VS} = 4.35 V	175	190	215	

For both typical I get:

$$t_{ON(min)} = \frac{L_P}{V_{IN(max)} \times \sqrt{2}} \times \frac{I_{PP(max)} \times V_{CST(min)}}{V_{CST(max)}}$$

VIN(max) = 230 + 15% = 230 * 1.15 = 264.5
tON(min) = 85.7 ns

Also for the next check. Does the calculated value for tDMAG(min) be higher OR lower than the 1.2 us specification? And which tON value do I need to use in the equation.

$$t_{DMAG(min)} = \frac{t_{ON} \times V_{IN(max)} \times \sqrt{2}}{N_{PS} \times (V_{OCV} + V_F)}$$

I hope I can get answers to there questions. So I have a better change it works when I made it.

Best regards,
Maarten