

Spec => $I_{out} = 333 \text{ mA}$
 $V_{out} = 80 \text{ V}$
 $V_{in} = 110 \text{ V}_{AC}$

①

- How did you obtain the inductance value is it based on predesigned transformer?

$$\frac{L_1}{L_2} = \left(\frac{N_1}{N_2} \right)^2$$

$$\sqrt{\frac{400 \mu}{550 \mu}} = \frac{N_1}{N_2}$$

$$\frac{N_1}{N_2} = 0.8528$$

$$D = \frac{V_{out} \cdot N}{V_{out} \cdot N + V_{in}}$$

$$= \frac{80(0.8528)}{80(0.8528) + 110}$$

$$= 0.3828$$

Table 1. Predesigned Transformers—Typical Specifications, Unless Otherwise Noted

TRANSFORMER PART NUMBER	SIZE (L x W x H)	L _{PR} (μH)	N _{PSA} (N _P :N _S :N _A)	R _{PR} (mΩ)	R _{SEC} (mΩ)	MANUFACTURER	TARGET APPLICATION (V _{OUT} /I _{OUT})
JA4429	21.1mm x 21.1mm x 17.3mm	400	1:0.24:0.24	252	126	Coilcraft	22V/1A
7508110210	15.75mm x 15mm x 18.5mm	2000	6.67:1:1.67	5100	165	Würth Elektronik	10V/0.4A
750813002	15.75mm x 15mm x 18.5mm	2000	20:1:0.5:0	6100	25	Würth Elektronik	3.8V/1.1A
750811330	43.2mm x 39.6mm x 30.5mm	300	6:1:0:1:0	150	25	Würth Elektronik	18V/5A
750813144	16.5mm x 18mm x 18mm	600	4:1:0.71	2400	420	Würth Elektronik	28V/0.5A
750813134	16.5mm x 18mm x 18mm	600	8:1:1.28	1850	105	Würth Elektronik	14V/1A
750811291	31mm x 31mm x 25mm	400	1:1:0.24	550	1230	Würth Elektronik	85V/0.4A
750813390	43.18mm x 39.6mm x 30.48mm	100	1:1:0.22	150	688	Würth Elektronik	90V/1A
750811290	31mm x 31mm x 25mm	460	1:1:0.17	600	560	Würth Elektronik	125V/0.32A
X-11181-002	23.5mm x 21.4mm x 9.5mm	500	72:16:10	1000	80	Premo	30V/0.5A

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application with PFC

②

$$R_{sense} = \frac{2(1-D)N}{I_{out} \cdot 42} \times 95\%$$

- how did you get $R_{sense} = 0.06 \Omega$?

$$= \frac{2(1-0.3828)(0.8528)}{(333 \times 10^{-3})(42)} \times \frac{95}{100}$$

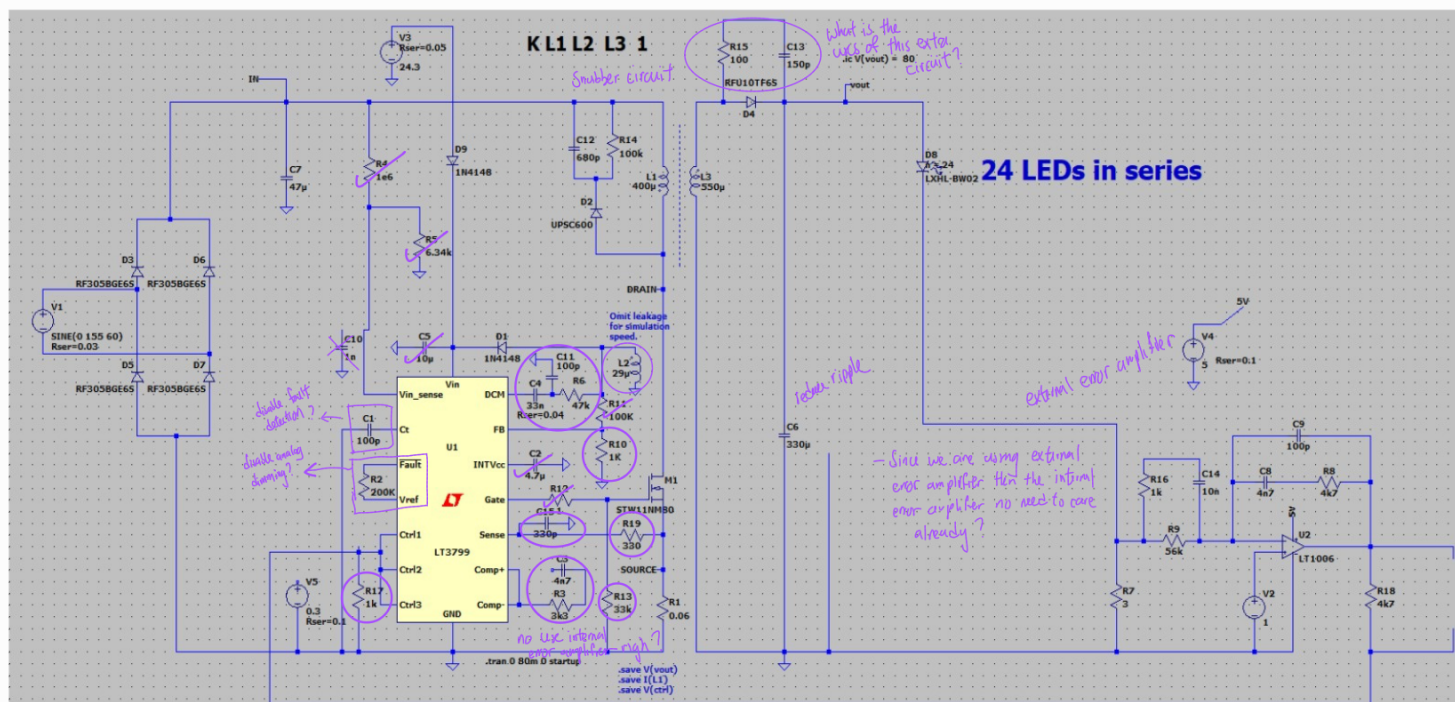
$$= 0.07150$$

$$I_{out(max)} = 2(1-D) \left[\frac{N}{42 \cdot R_{sense}} \right]$$

$$= 2(1-0.3828) \left[\frac{0.8528}{42(0.07150)} \right]$$

$$= 0.3505 \text{ A}$$

How did you get all this components



Component Values for Input Voltage Ranges

	R5 (Ω)	R10 (Ω)	R _S (Ω)	R1 (Ω)	C2 (μ F)	C3 (μ F)
Optimized for 110V	6.34k	16.2k	0.05	200	0.1	0.22
Optimized for 220V	3.48k	24.9k	0.075	1.00k	0.033	0.1
Universal	3.48k	15.4k	0.05	200	0.1	0.22