From LM3481 TI application note

$$L_M(V_{IN}) = \frac{V_{IN}^2 \times \eta}{K_L \times P_O \times f_S} \times \frac{V_{OUT}^2 \times N_{ps}^2}{\left(V_{IN} + V_{OUT} \times N_{ps}\right)^2}$$

where

- P_o is output power
- f_s is flyback converter frequency

Table 2. Design Specifications

PARAMETER	EXAMPLE VALUE
Vin min	5 VDC
Vin max	32 VDC
Vout	12 VDC
Iout	2 max
Target switching frequency	130 kHz

Setting f_s = 130 kHz, K_L = 0.2 and η = 0.85, the curve of L_m and V_{in} relationship could be derived as shown in Figure 9. Choose L_m = 12 µH.

$$N_{ps} = \frac{V_{IN\_min}}{V_{OUT}} \times \frac{D_{max}}{1 - D_{max}} = \frac{5 \times 0.7}{12 \times (1 - 0.7)} \approx 1 \qquad (23)$$

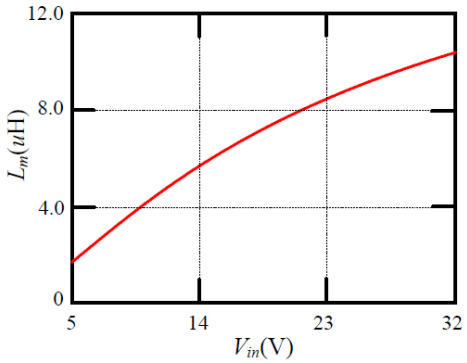

Figure 9. The Curve of Lm and Vin Relationship

$Vin\_min := 5\ V$ $Vin\_max := 32\ V$ $Iout := 2\ A$ $Nps := 1$ $Kl := 0.2$

$Vout := 12\ V$ $Po := Vout \cdot Iout$ $Po = 24\ W$ $n := 0.85$ $fs := 130\ kHz$

$$Lm\_min := \frac{Vin\_min^2 \cdot n}{Kl \cdot Po \cdot fs} \cdot \frac{Vout^2 \cdot Nps^2}{\left(Vin\_min + Vout \cdot Nps\right)^2} \quad Lm\_min = 16.968\ \mu H \quad @5Vin$$

$$Lm\_max := \frac{Vin\_max^2 \cdot n}{Kl \cdot Po \cdot fs} \cdot \frac{Vout^2 \cdot Nps^2}{\left(Vin\_max + Vout \cdot Nps\right)^2} \quad Lm\_max = 103.751\ \mu H \quad @32Vin$$

Calculated inductance values are not matching with the Figure 9. To be checked with TI supplier