

# Block design: PSFB resonant inductor

- $E_{\text{STORE}}$  in  $L_S$  charges total  $C_{\text{OSS}}$  of one leg
- Achieve ZVS down to **Load<sub>MIN</sub> = 15%** of full load →

$$L_S \geq 2 \cdot COSS(Qa, avg) \cdot \frac{(V_{IN}(fb, nom))^2}{\left[ \text{LOAD}(\text{min}) \cdot \left( I_{PP} - \frac{\Delta I_{LOUT}}{N_{PS}(fb)} \right) \right]^2} - L_{LK} = 1.13 \cdot 10^{-5} H$$

- Where:  $L_{LK} = 3.5 \mu\text{H}$  (0.1% of magnetizing inductance) →  **$L_S = 10 \mu\text{H}$**
- $L_S$  RMS current and T1 primary current are the same (have only AC component)
- Select PQ20/20 platform with:
  - $\Delta B_{PK} = 118 \text{ mT}$ , 10 turns Litz wire (160x0.1 mm)
  - N97 EPCOS core, gap 0.77 mm,  $\mu_E = 57$
  - Results in copper losses = 0.63 W and core losses = 0.57 W