Forward Converter

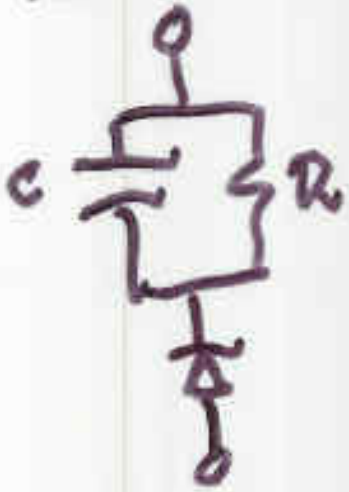
$D \leq 1/2$ restriction

avoided by

R-C-diode circuit

to

eliminate "reset coil"



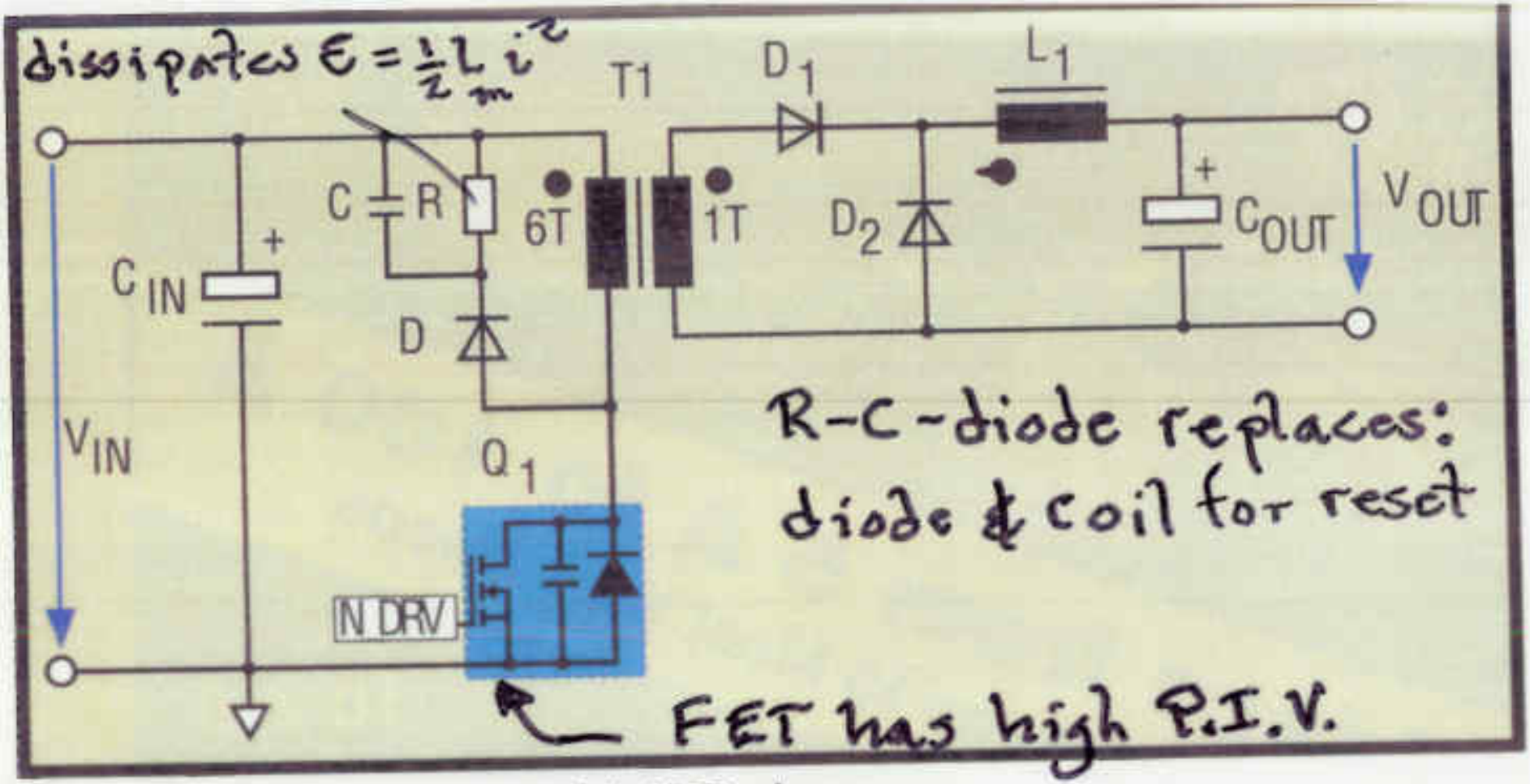


Fig. 1. *Forward converter with RCD clamp.*

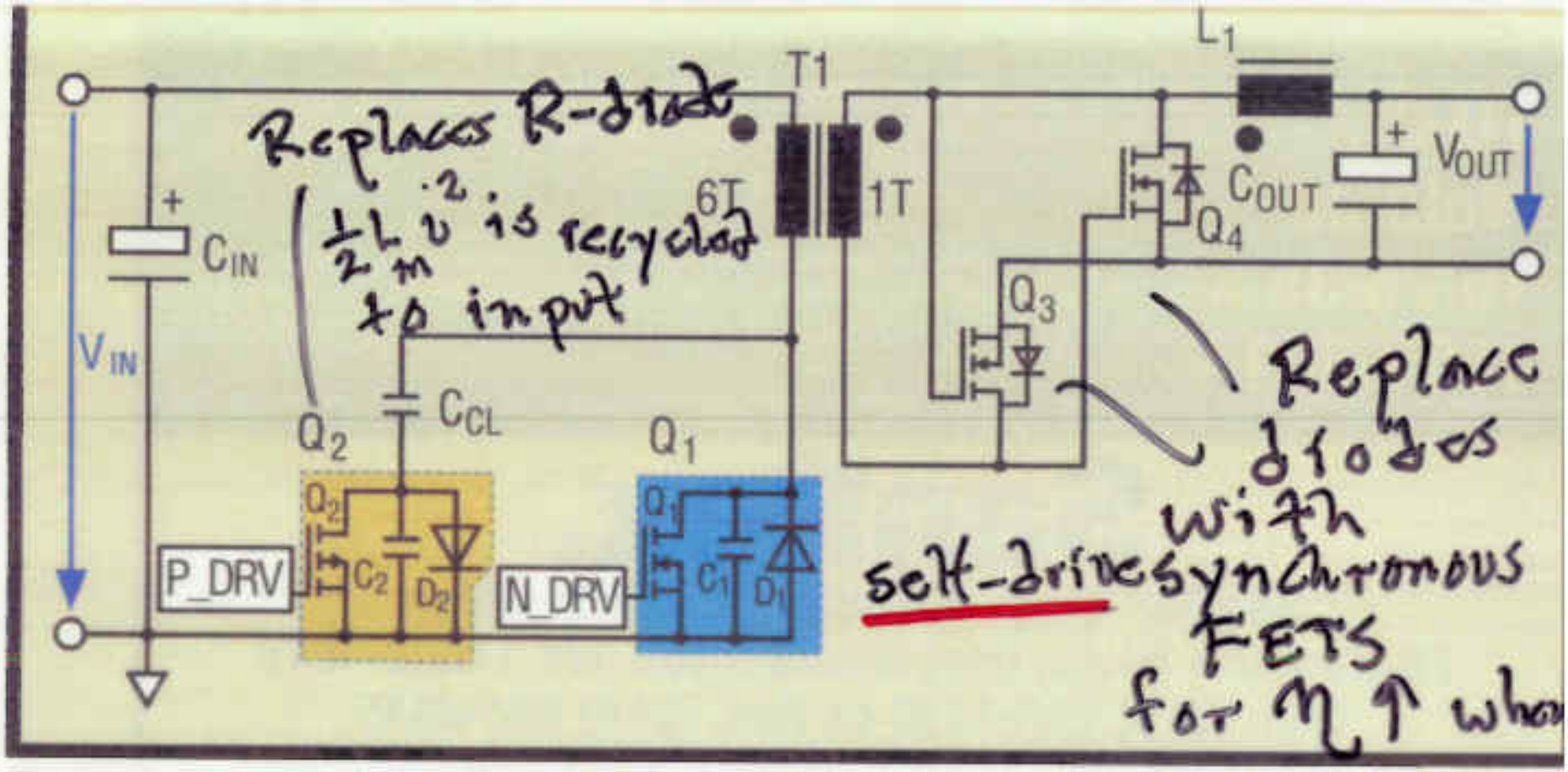


Fig. 2. *Active clamp schematic.*

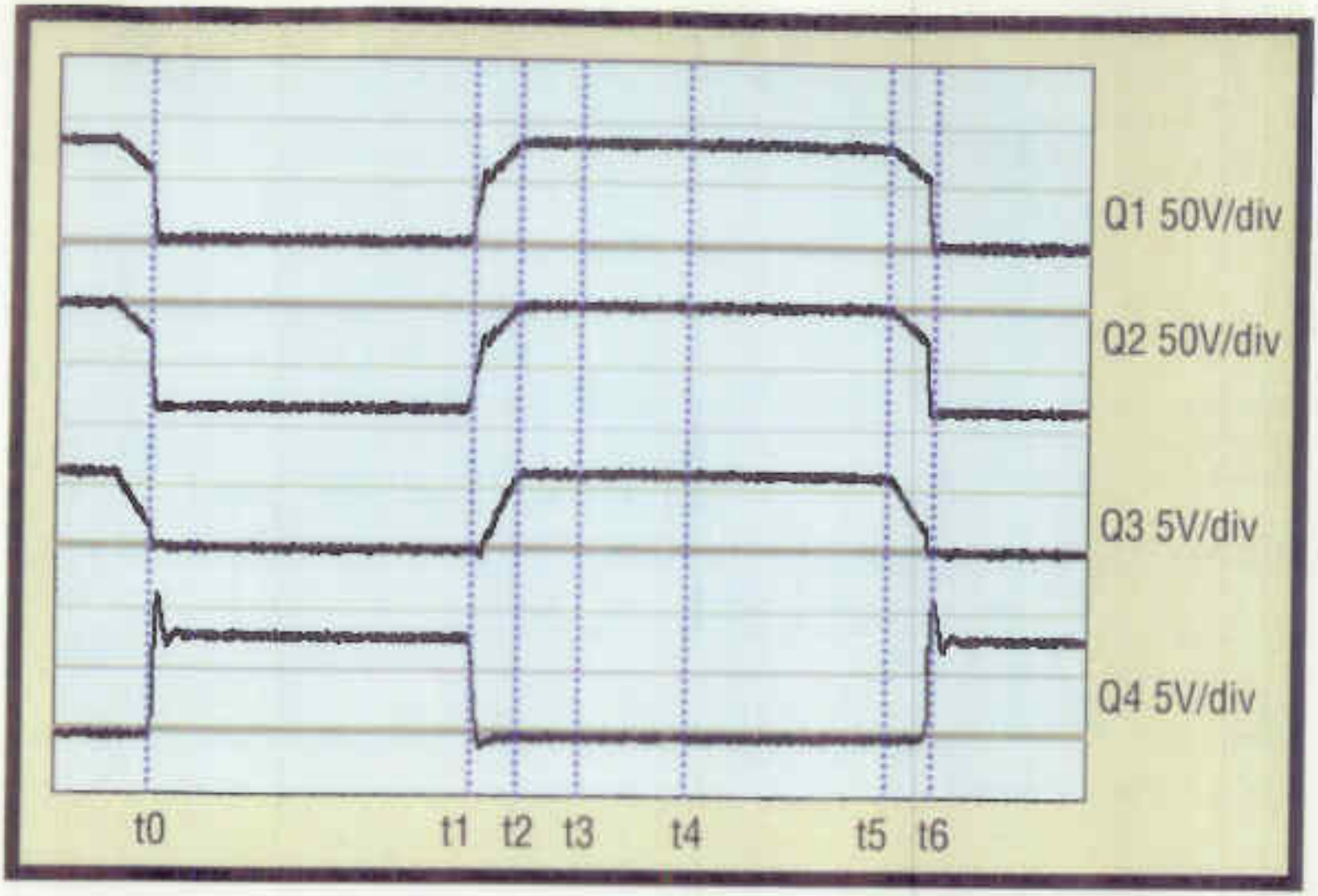


Fig. 3. *MOSFET Drain to source waveforms for Q_1 and Q_2 on the primary and Q_3 and Q_4 on the secondary side.*

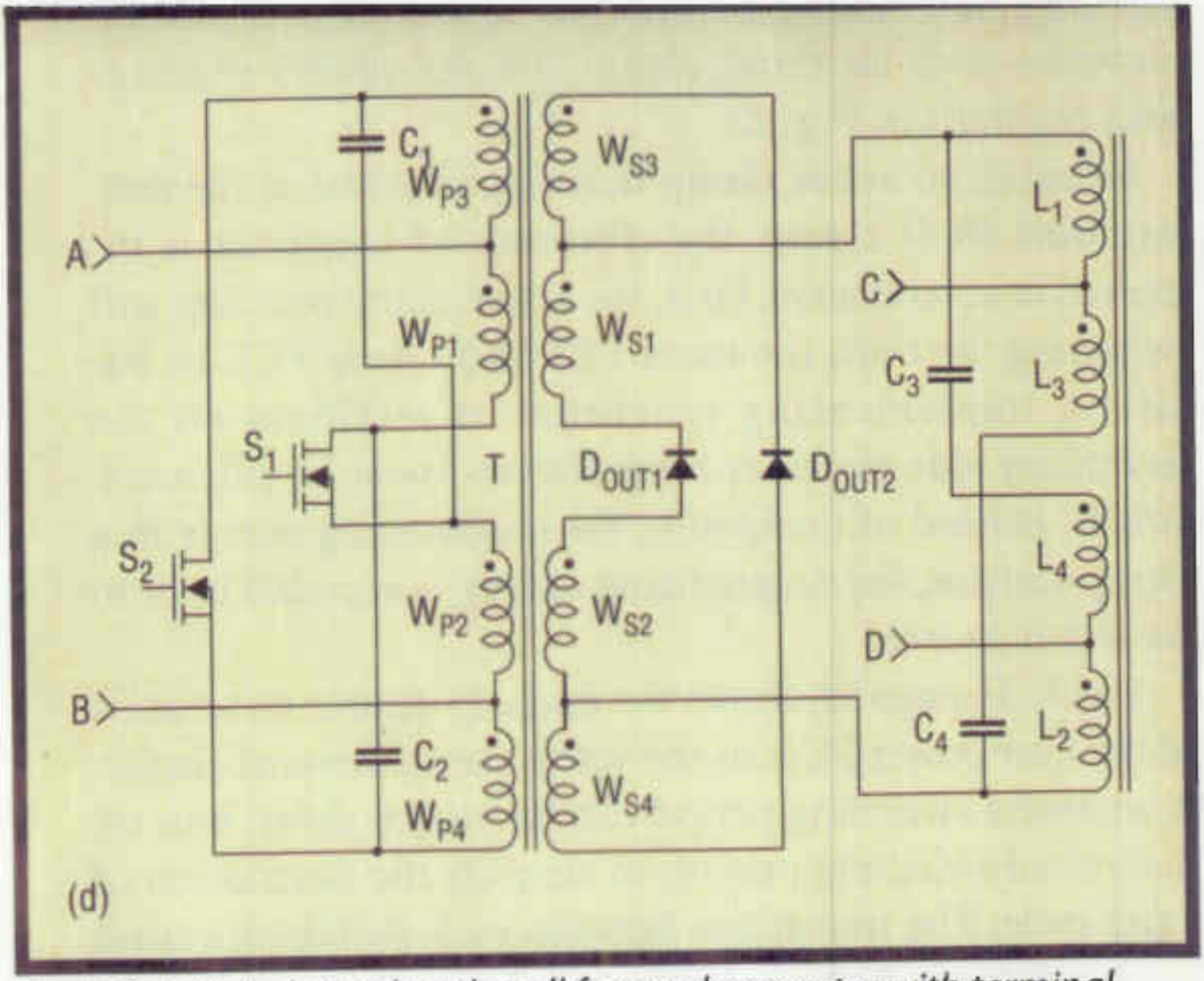


Fig. 4. (d) *Fully balanced push-pull forward converter with terminal ripple current cancellation.*

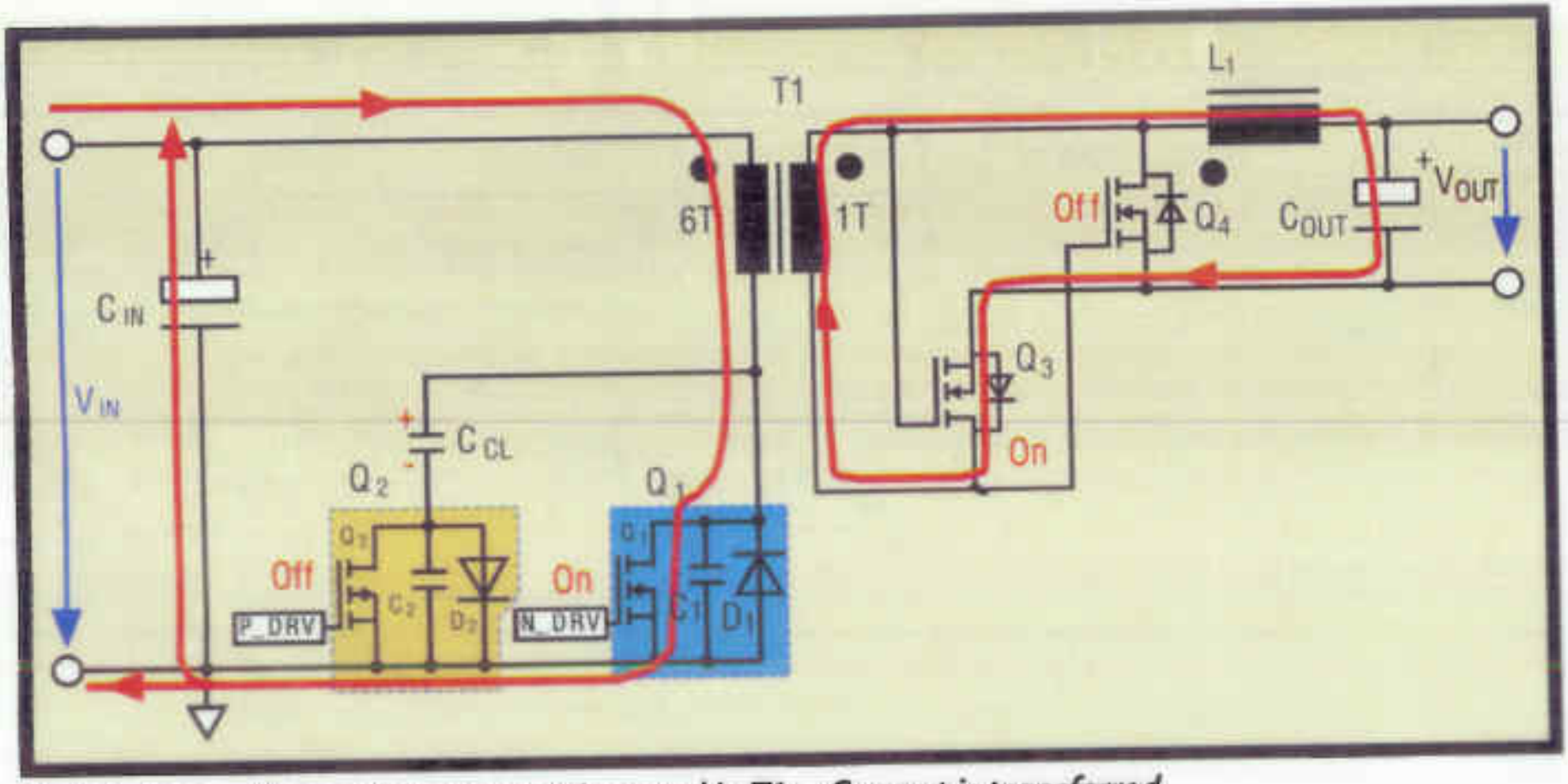


Fig. 4. t_0 -> t_1—*Magnetizing energy is stored in T1—Current is transferred.*

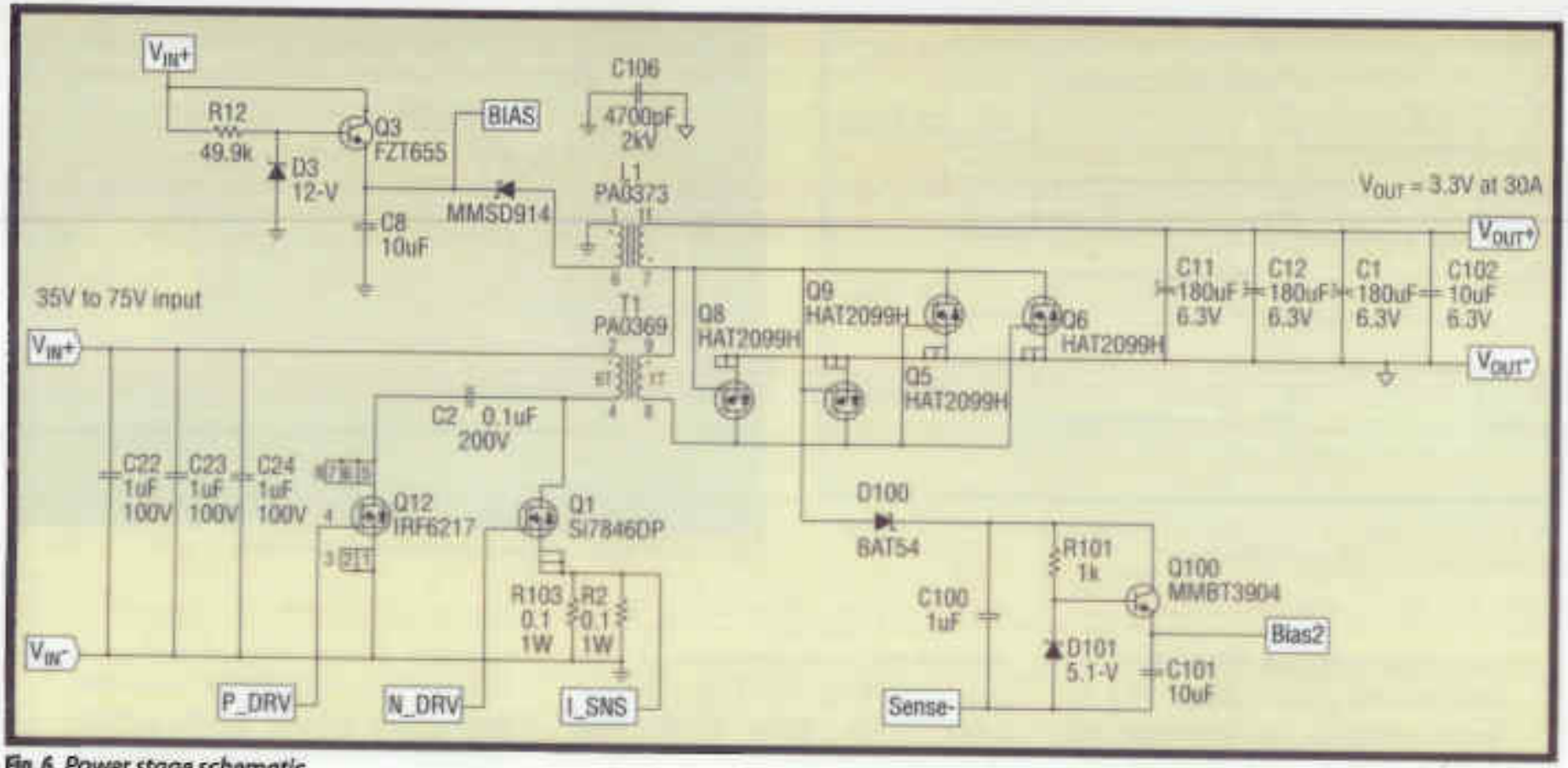


Fig. 6. *Power stage schematic.*

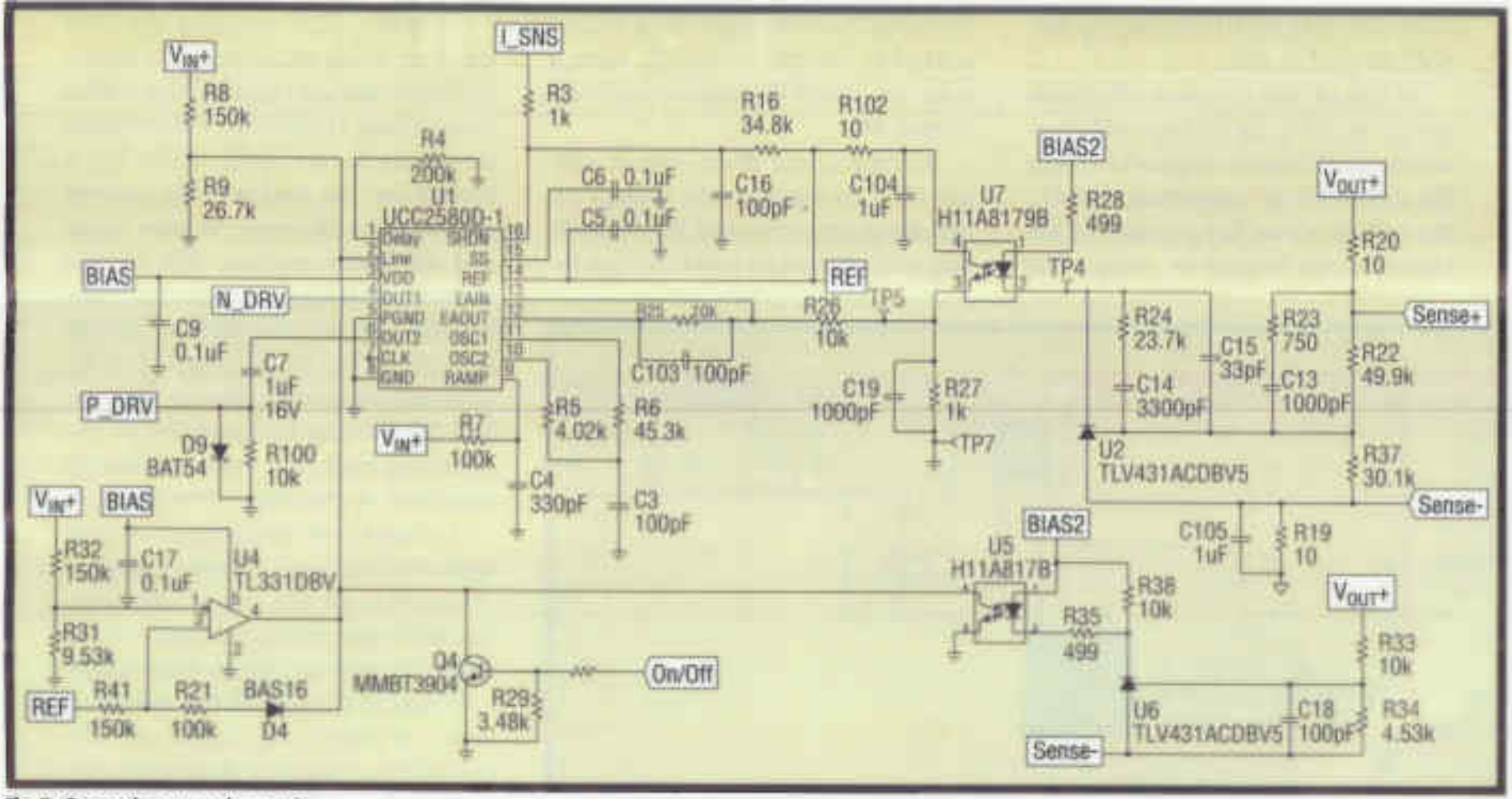
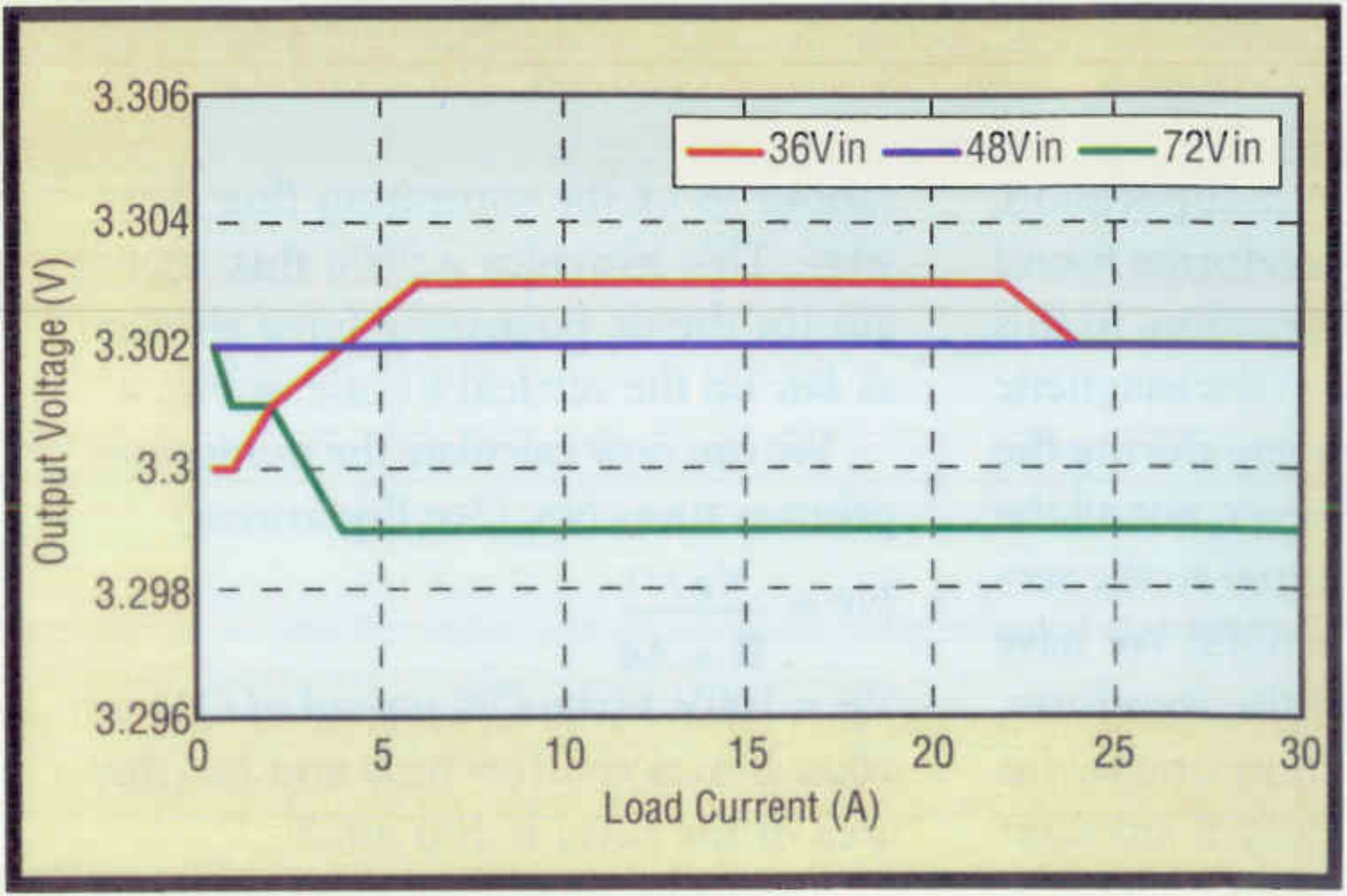
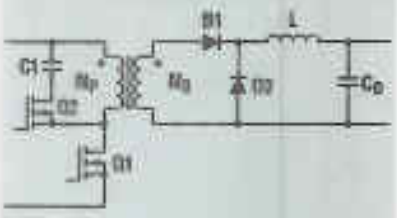


Fig. 7. *Control stage schematic.*


3.306
3.304
3.302
3.3
3.298
3.296
Output Voltage (V)
36Vin
48Vin
72Vin
0
5
10
15
20
25
30
Load Current (A)

ACTIVE CLAMP FORWARD



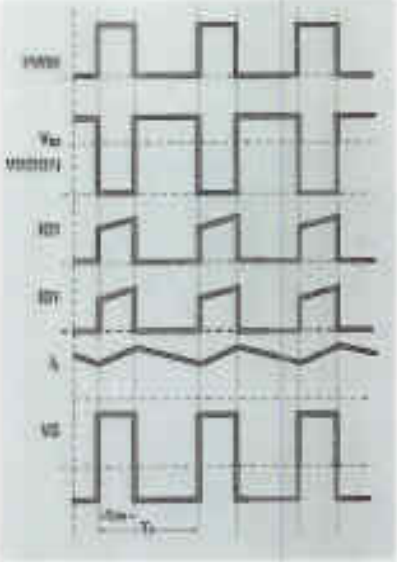
$$\frac{V_{OUT}}{V_{IN}} = \left(\frac{N_S}{N_P}\right) \times \left(\frac{t_{ON}}{T_P}\right) = \left(\frac{N_S}{N_P}\right) \times D$$

$$I_{D1}\,(max) = \left(\frac{N_S}{N_P}\right) \times I_{OUT}$$

$$VDS = V_{IN} \times \left(\frac{1}{1-D}\right)$$

$$I_{D1} = I_{OUT} \times D$$

$$V_{D1} = V_{OUT} + V_{IN} \times \left(\frac{N_S}{N_P}\right) \times \left(\frac{1}{1-D}\right)$$



Active Clamp and Reset Technique Enhances Forward Convertor Performance (SEM1000)

Design Considerations for Active Clamp and Reset Technique (SEM1100)

UCC3581, 2, 3, 4, 7

UCC3580-1

UC3824