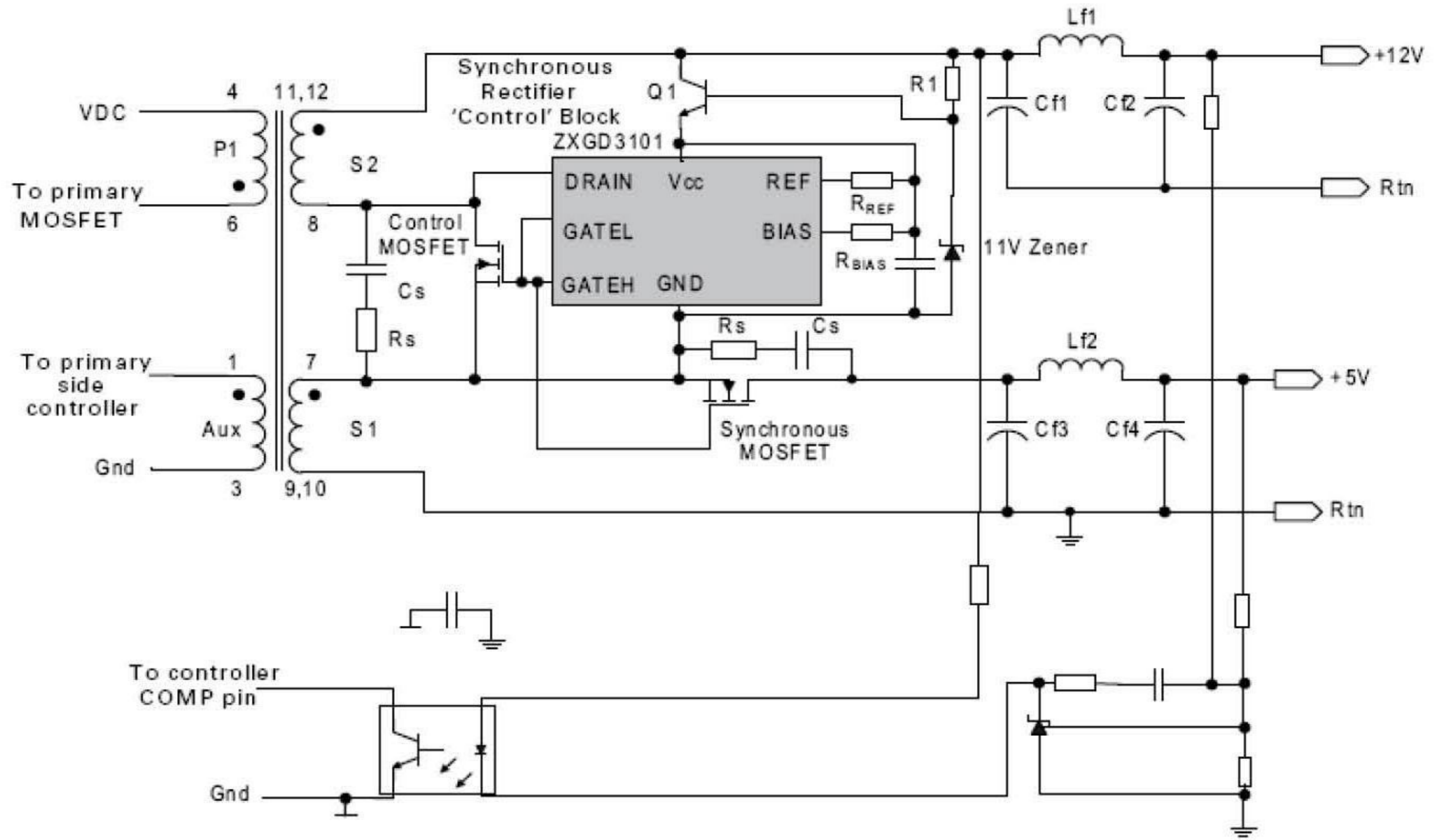


ZXGD3101

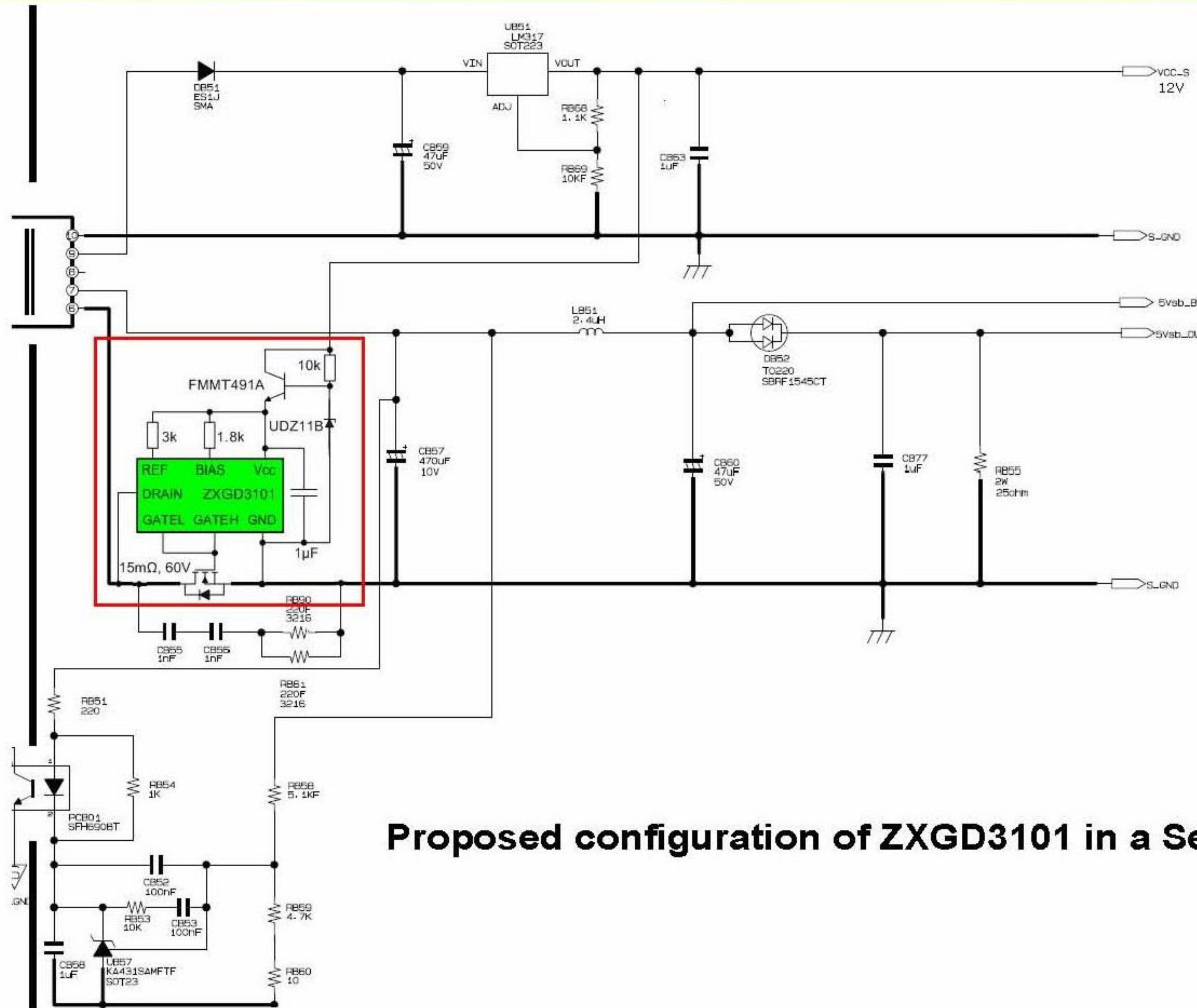
***Synchronous Rectifier MOSFET Driver
for SMPS Secondary Side***

Dual Output PSU for LCD monitors



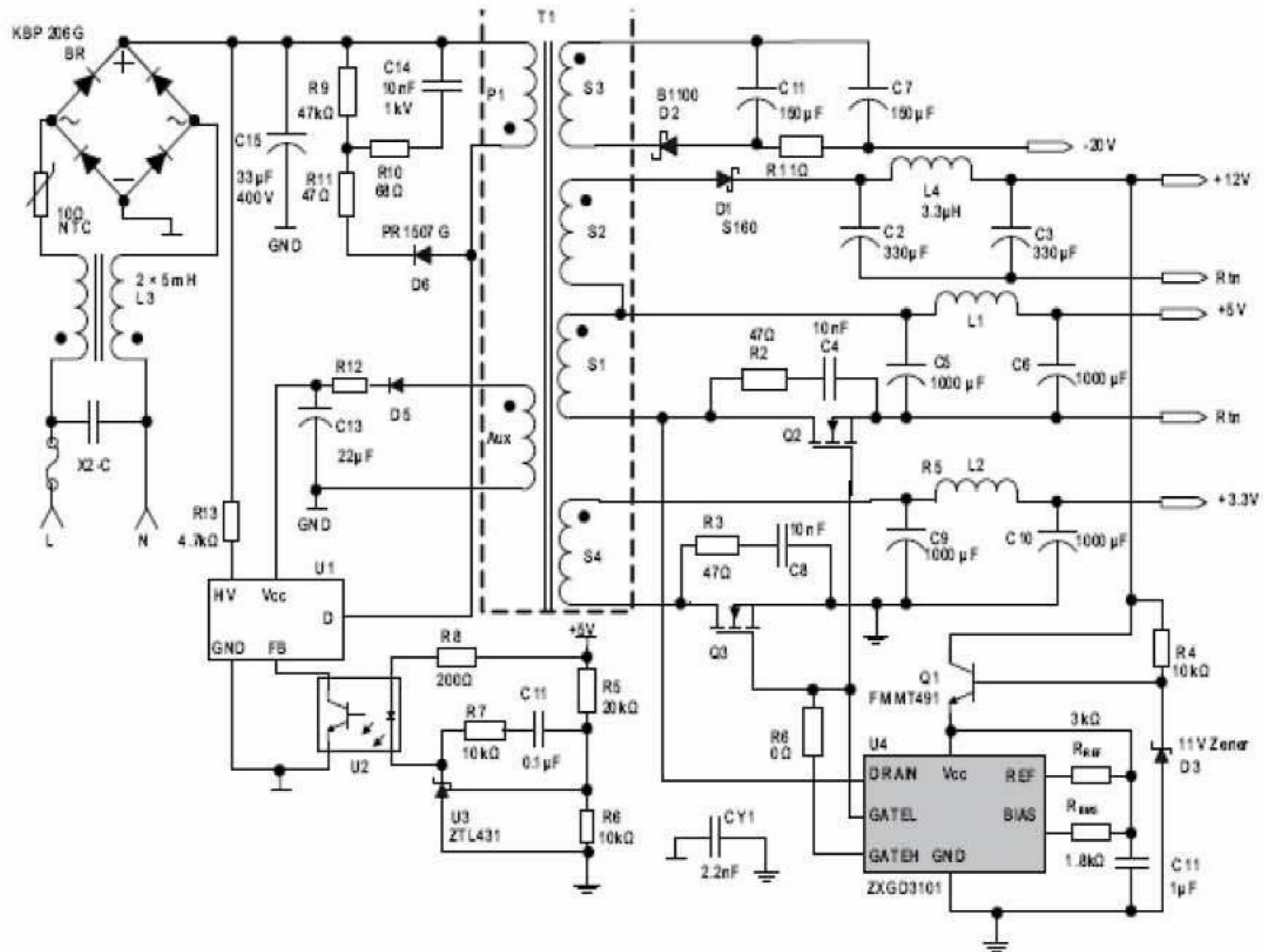
Proposed configuration of ZXGD3101 in a dual-output Flyback SMPS

5V Output rail for Server PSU



Proposed configuration of ZXGD3101 in a Server SMPS

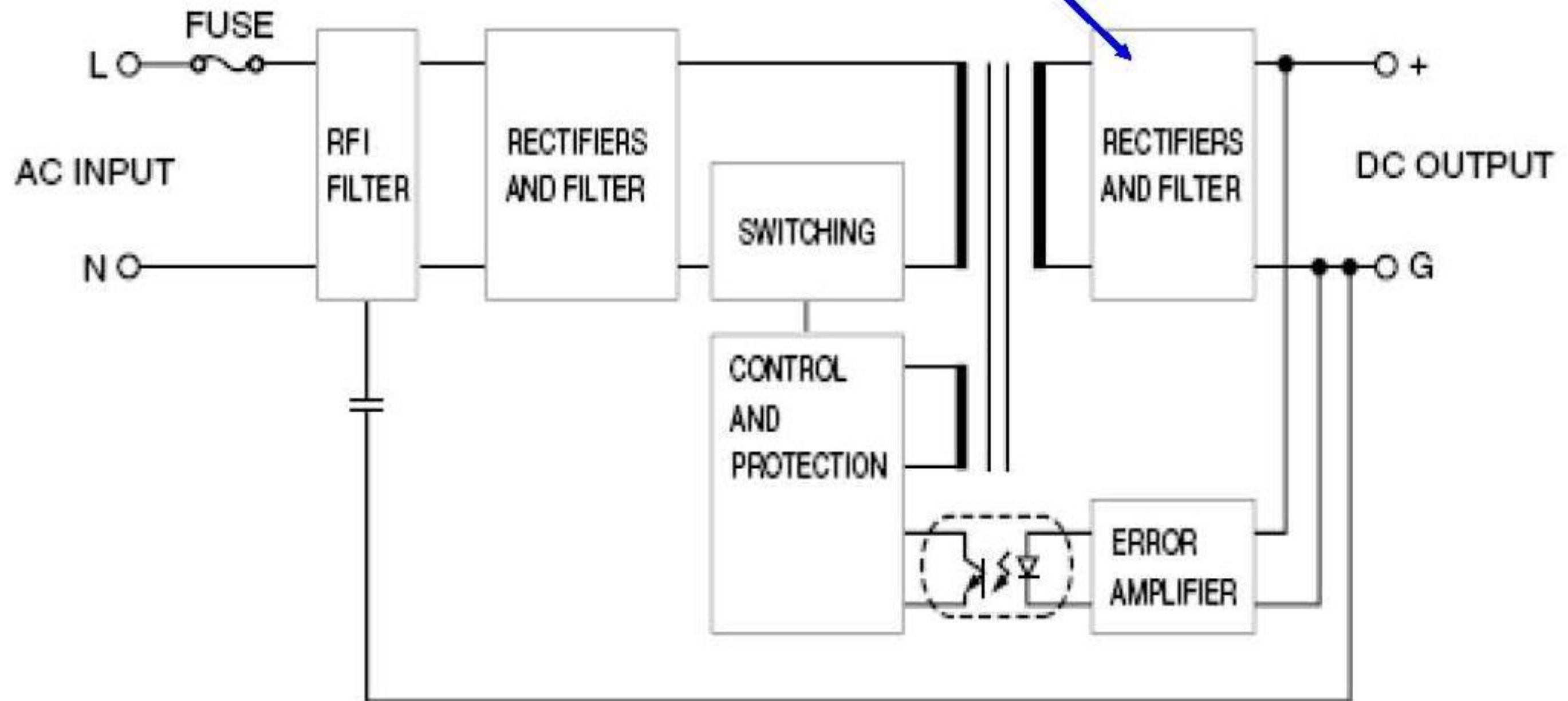
Set Top Box PSU



Proposed configuration of ZXGD3101 in a Set Top Box SMPS

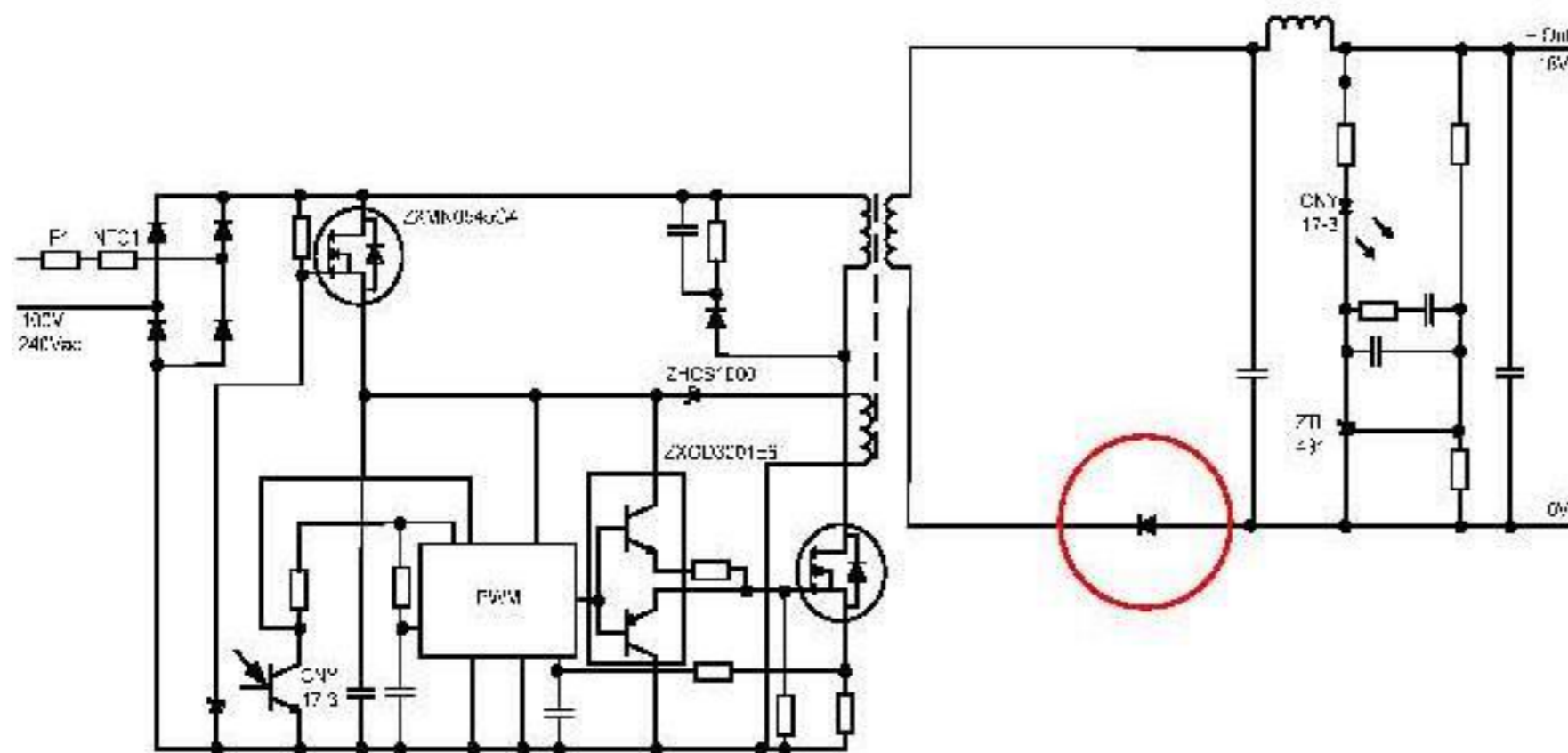
Basic Flyback topology

ZXGD3101 would be used here



Flyback Topology for Desk Top Adapters

Discrete and Analog Solutions
for Advancing Technologies

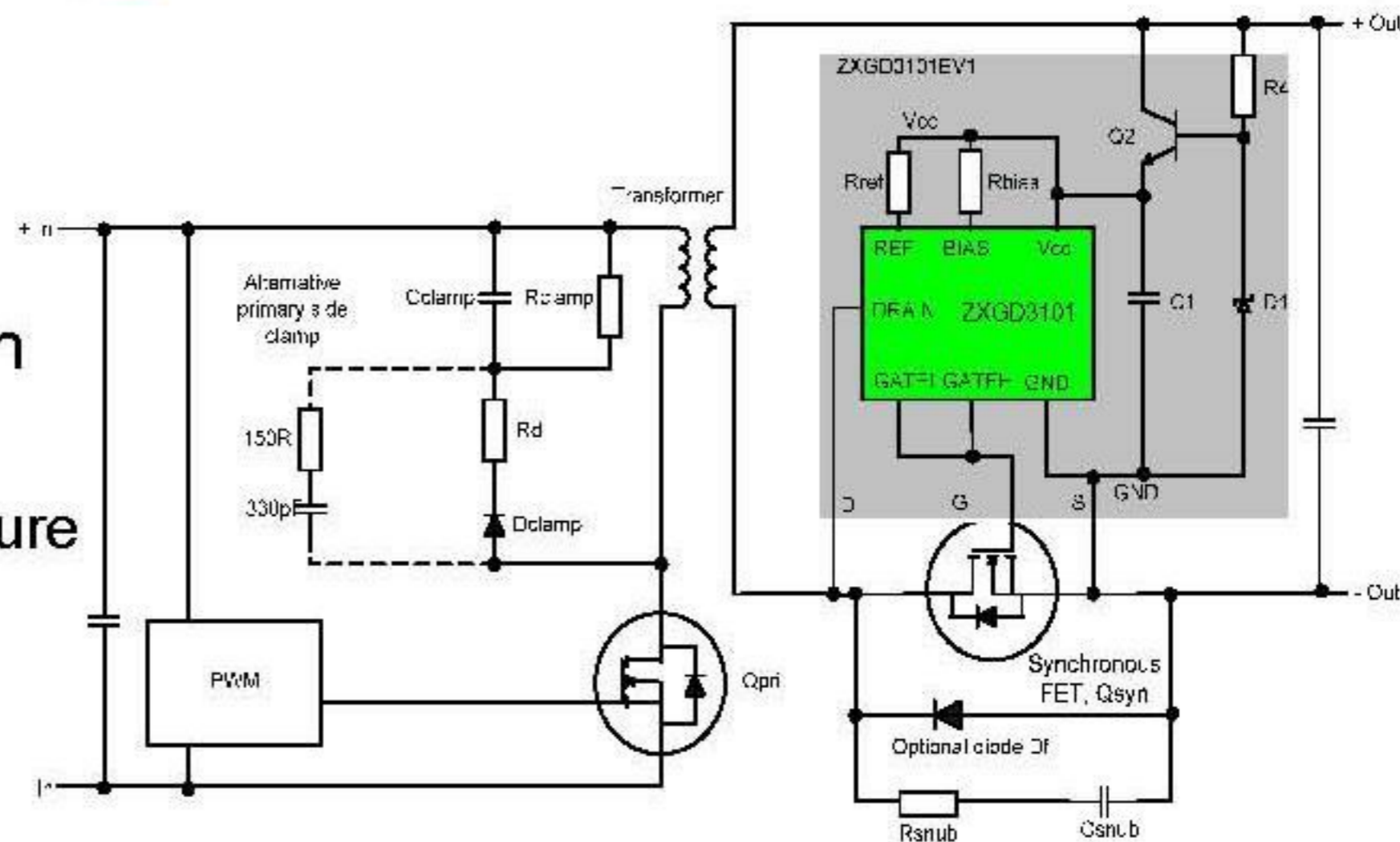


Diode Solution

- Efficiency 83 ~ 86%
- Bulky heat sinks
- < 0.5W standby

Synchronous Rectifier Solution

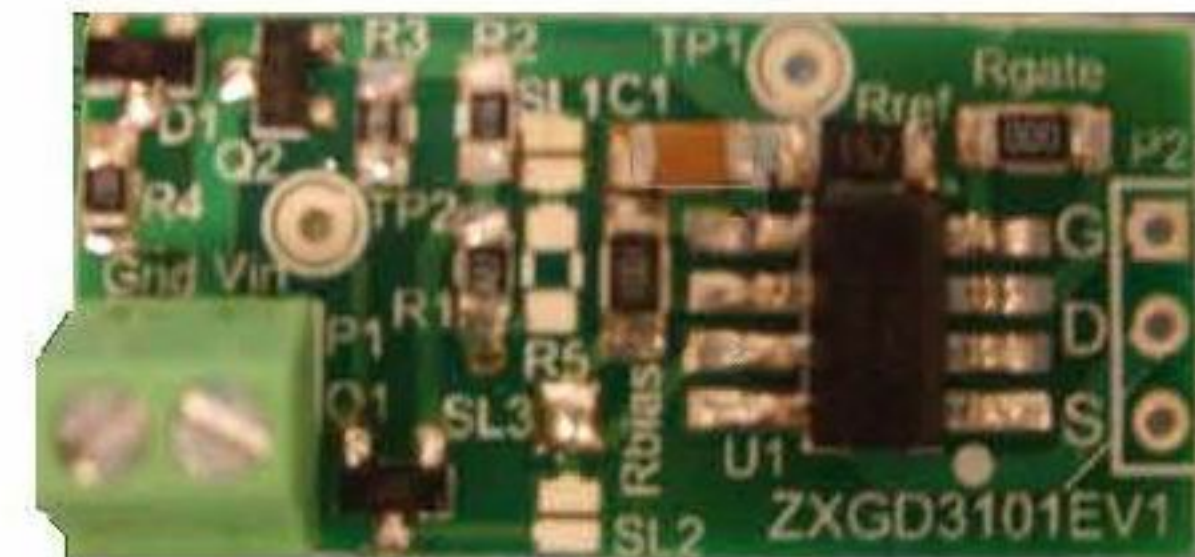
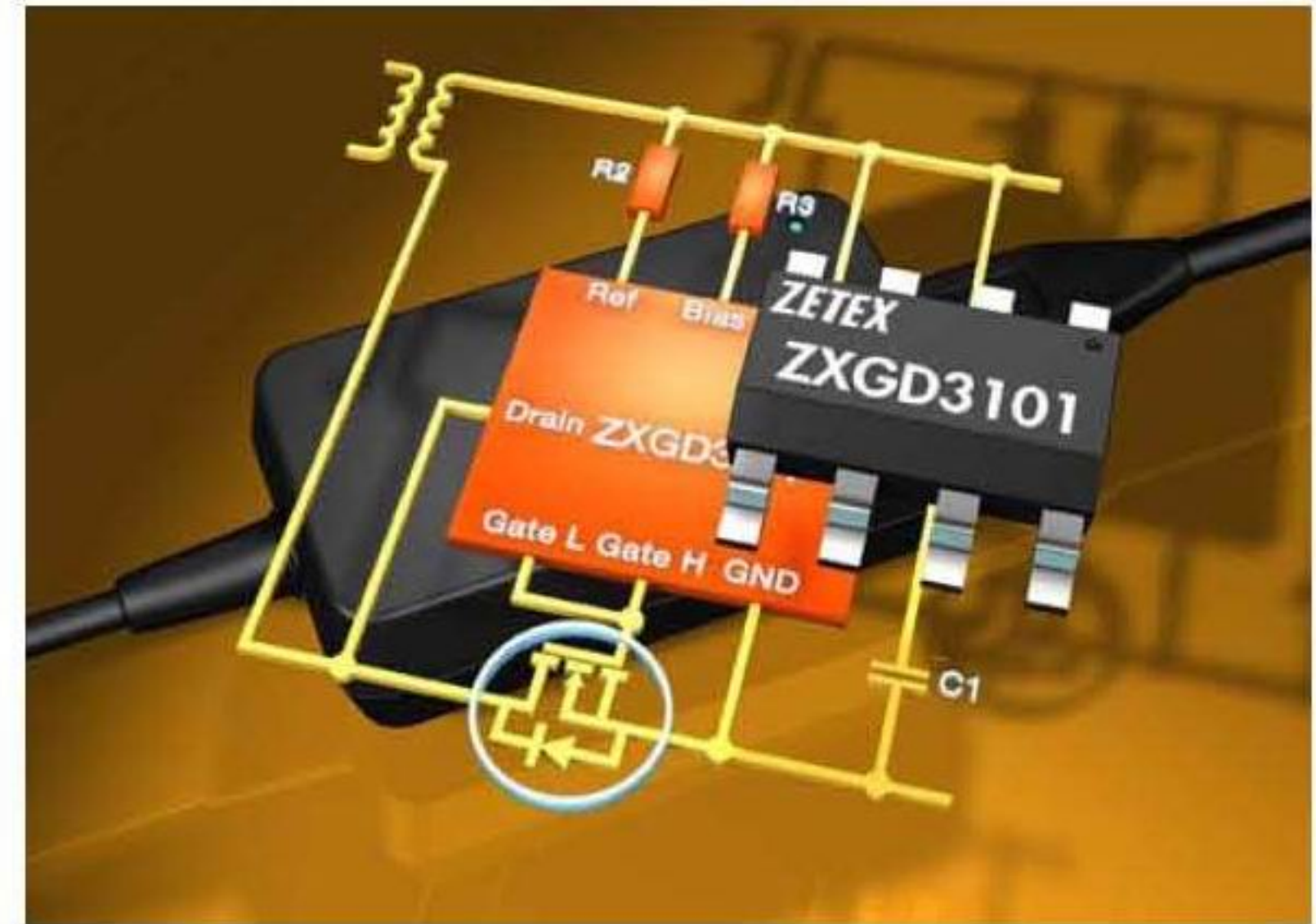
- Efficiency > 87%
- Lower operating temperature
- < 0.5W standby



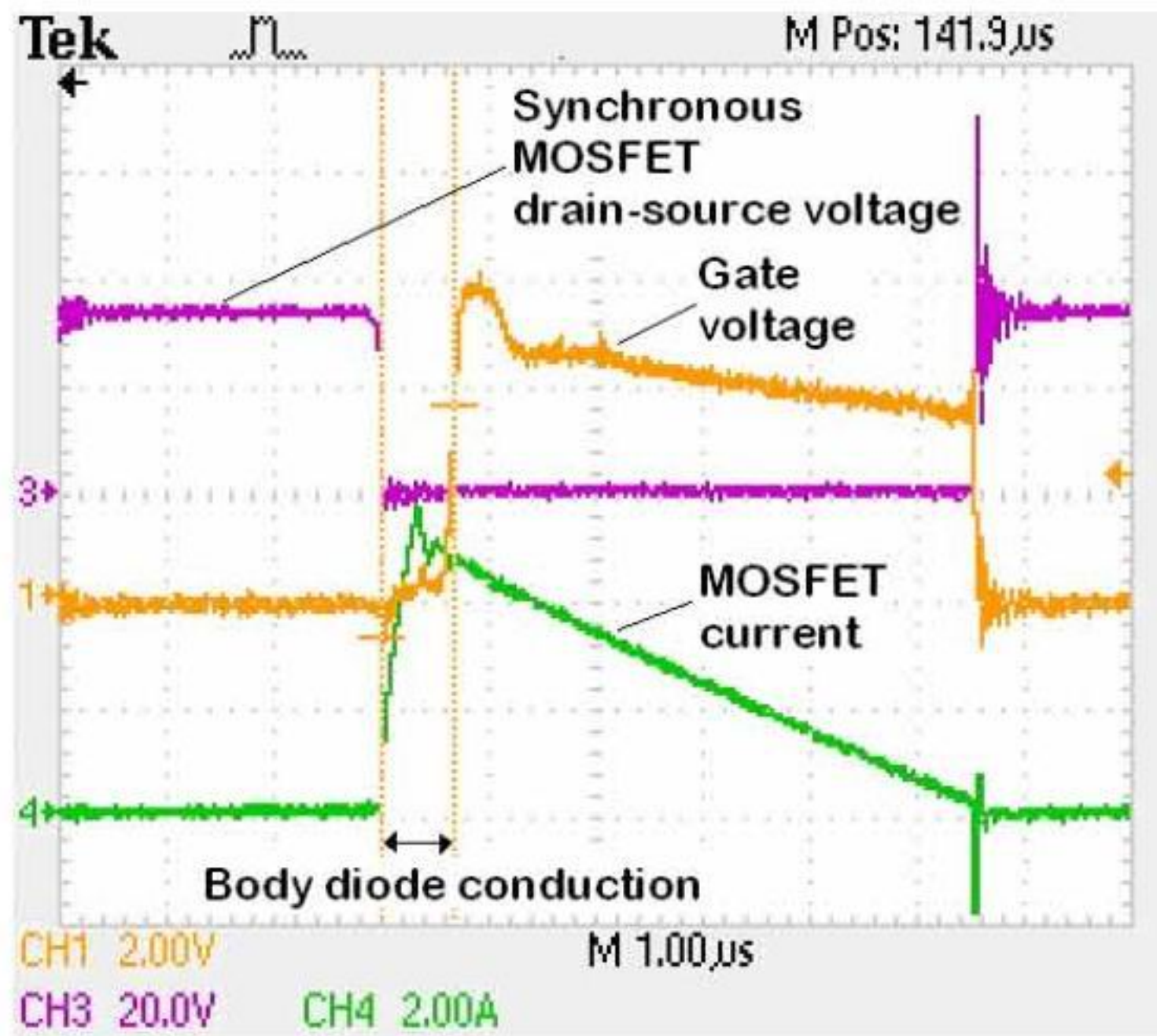
Synchronous MOSFET controller / driver

Discrete and Analog Solutions
for Advancing Technologies

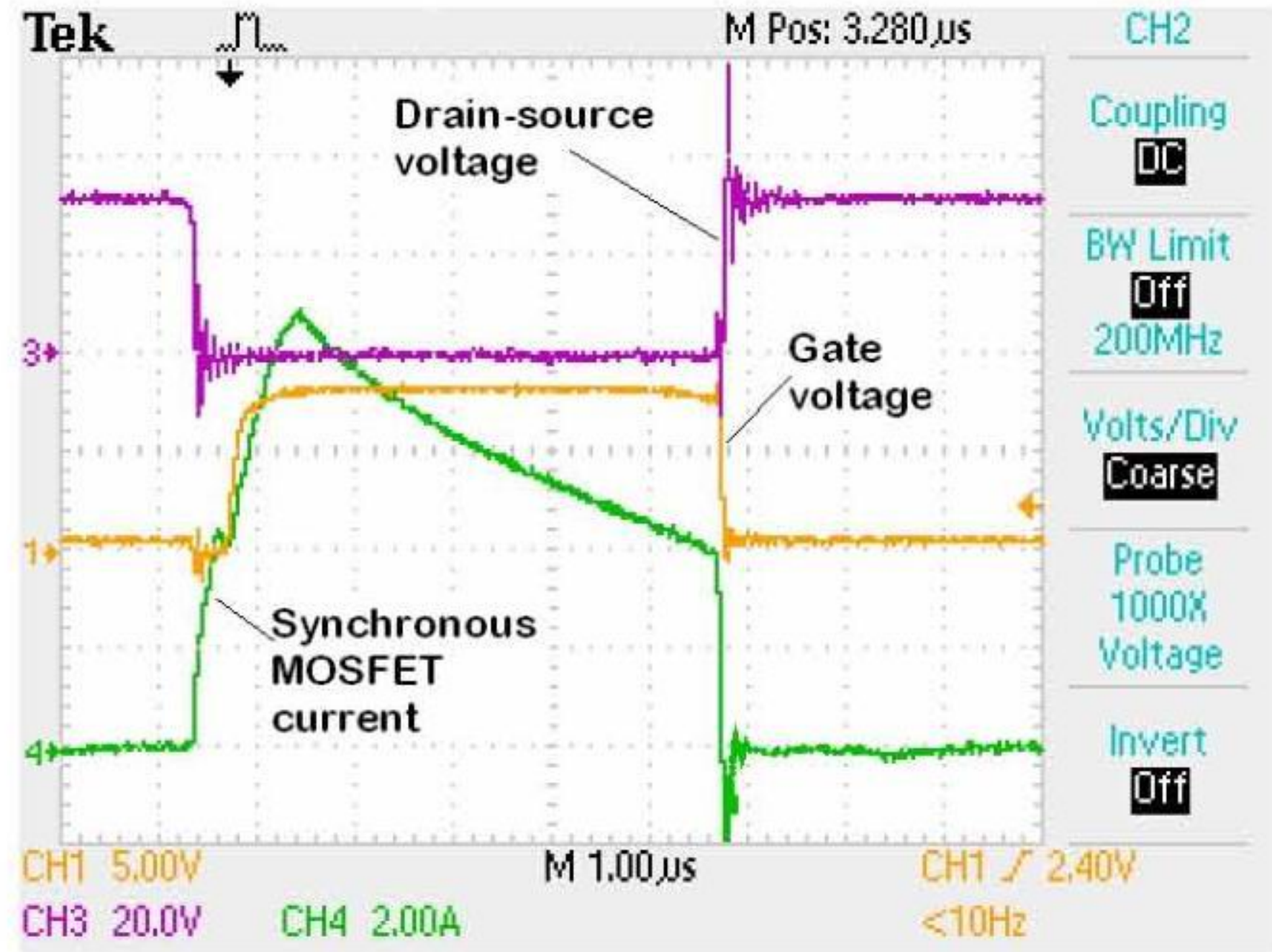
- Senses the point at which secondary current reaches zero
- High voltage differential amplifier & high current MOSFET driver
- Source & sink currents typ. 2.5A
- Needs just 3 external components
- Simple: no timing info from primary side, no timing components on secondary side



ZXGD3101 Switching waveforms in CCM and CrCM



(a) Critical conduction mode (CrCM)



(b) Continuous conduction mode (CCM)

Energy efficiency initiatives

Discrete and Analog Solutions
for Advancing Technologies



Powered by an
ENERGY STAR®
qualified adapter
for a better
environment



For Single Voltage External AC-DC and AC-DC Power Supplies

| Specification | US Energy & Conservation Act | Energy Star® V2.0 | Eu Code of Conduct Ver 3 |
|-----------------------------------|---|---|---|
| Implementation Date | July 1, 2008 | November 1, 2008 | January 1, 2009 |
| Average Efficiency in Active Mode | $\geq 85\%$ ($> 51W$) | $\geq 87\%$ ($> 49 W$) | $\geq 87\%$ ($36 < W \leq 250$) |
| Maximum Power in No-load | $\leq 0.5W$ (≥ 50 to $\leq 250W$) | $\leq 0.5W$ (≥ 50 to $\leq 250W$) | $\leq 0.5W$ (≥ 50 to $\leq 250W$) |
| PFC requirement | - | ≥ 0.9 ($\geq 100W$) | - |

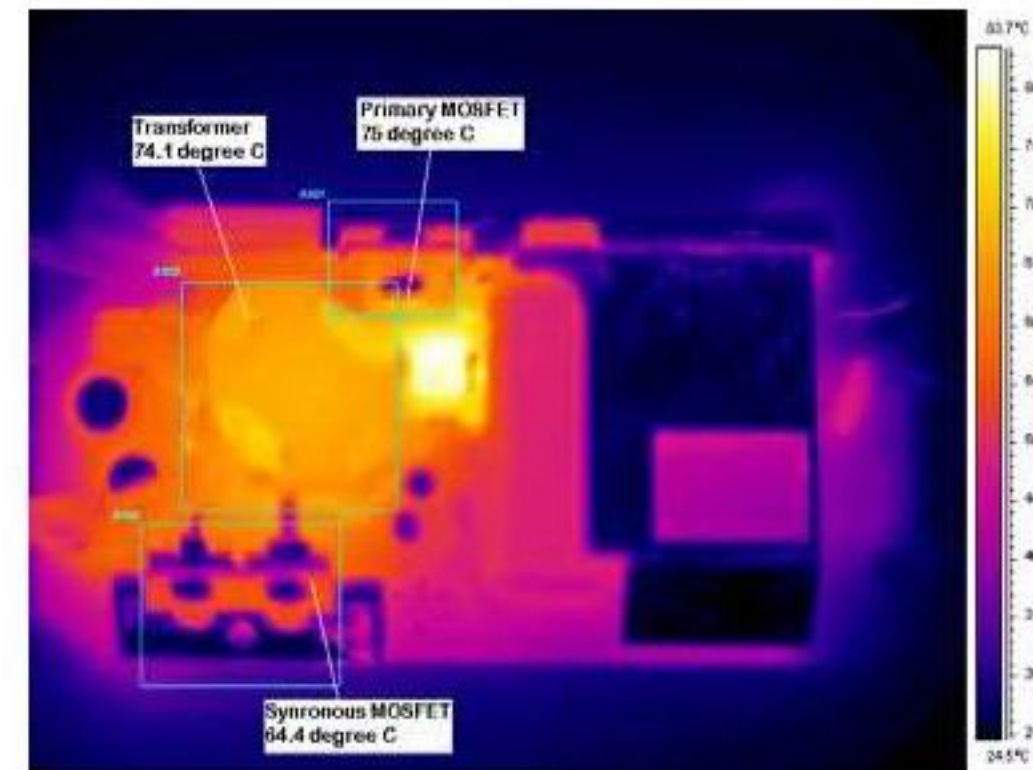
Results on 60W adapter using ZXGD3101

Discrete and Analog Solutions
for Advancing Technologies

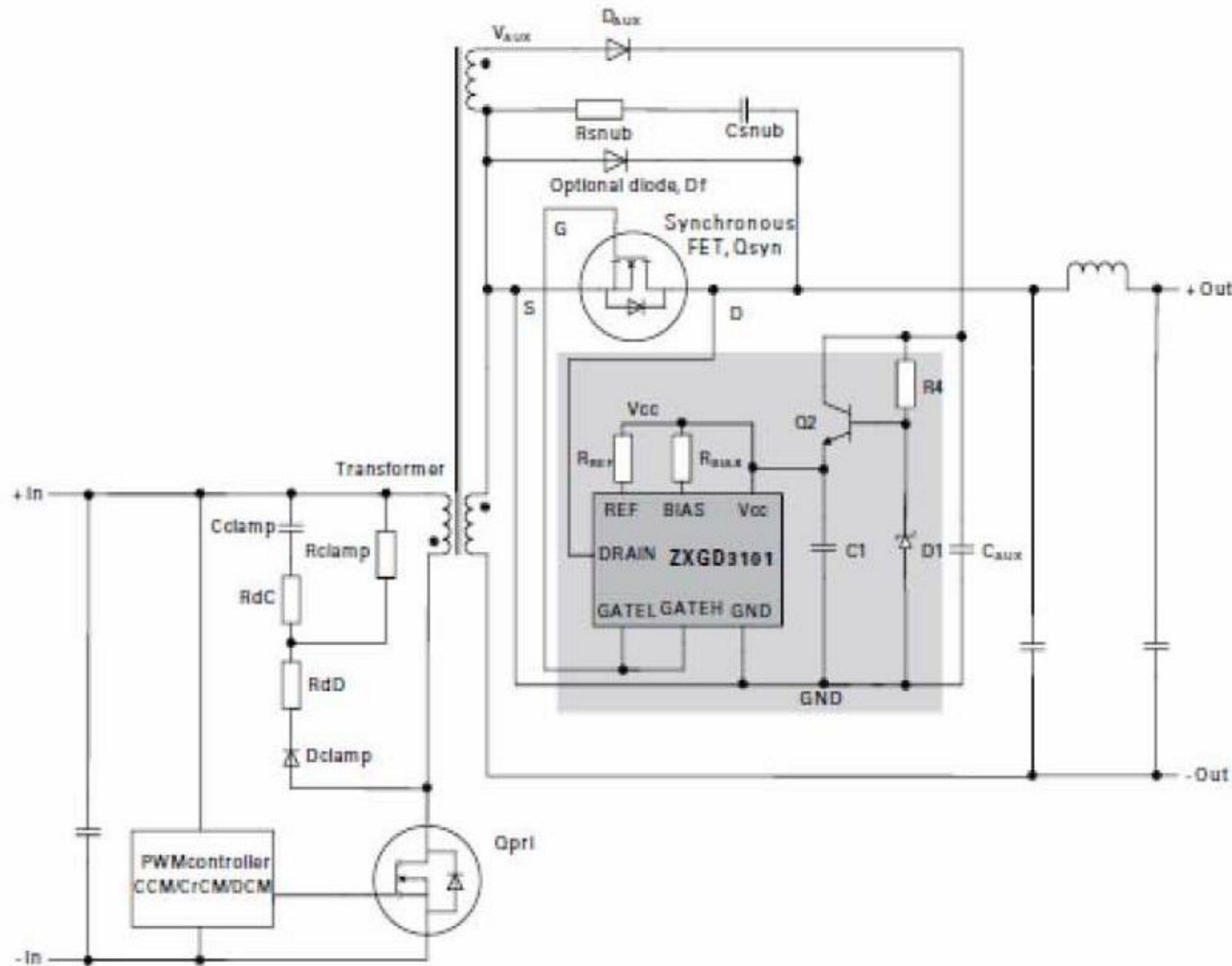
| | No-Load | Active Mode | | | | |
|----------------------------------|---------|-------------|-------|-------|-------|---------|
| Percentage of name plate current | 0% | 25% | 50% | 75% | 100% | Average |
| DC Output Current (A) | | 0.792 | 1.599 | 2.406 | 3.220 | |
| DC Output Voltage (V) | | 19.94 | 18.76 | 18.71 | 18.63 | |
| DC Output Power (W) | | 15 | 30 | 45 | 60 | |
| | | | | | | |
| AC Input Voltage (V) | 115 | 115 | 115 | 115 | 115 | |
| AC Input Power (W) | 0.36 | 17.05 | 33.77 | 50.93 | 68.2 | |
| | | | | | | |
| Power Consumed by UUT (W) | 0.36 | 2.05 | 3.77 | 5.93 | 8.2 | |
| Efficiency (%) | | 87.97 | 88.84 | 88.36 | 87.98 | 88.29 |

Additional benefits of using sync. rectification

- **Less heat generation**
 - Lower operating temperatures
 - Improved reliability
- **Allows surface mount sync rectifiers (MOSFETs)**
 - Smaller or even no heat sinks
 - Size reduction of power supply
 - Increased current capability
 - Weight reduction
 - Reduced assembly time



High Side Configuration



Proposed configuration of ZXGD3101 for high-side rectification

Efficiency Comparison

Comparison between Ultra-fast diode and Synchronous MOSFET
in a 80W (18V, 4.5A) DCM Flyback laptop adapter

