



# SP6003 Synchronous Rectifier MOSFET Driver

## SP6003 Reference Design Board

The following is the schematic and layout for SP6003 reference design board. The purpose of this design board is to easily examine the functionalities and characteristics of SP6003, synchronous rectifier driver ICs. Just simply replace the diode of the secondary side of the SMPS with its respective pin out. The typical schematic is described as follows:

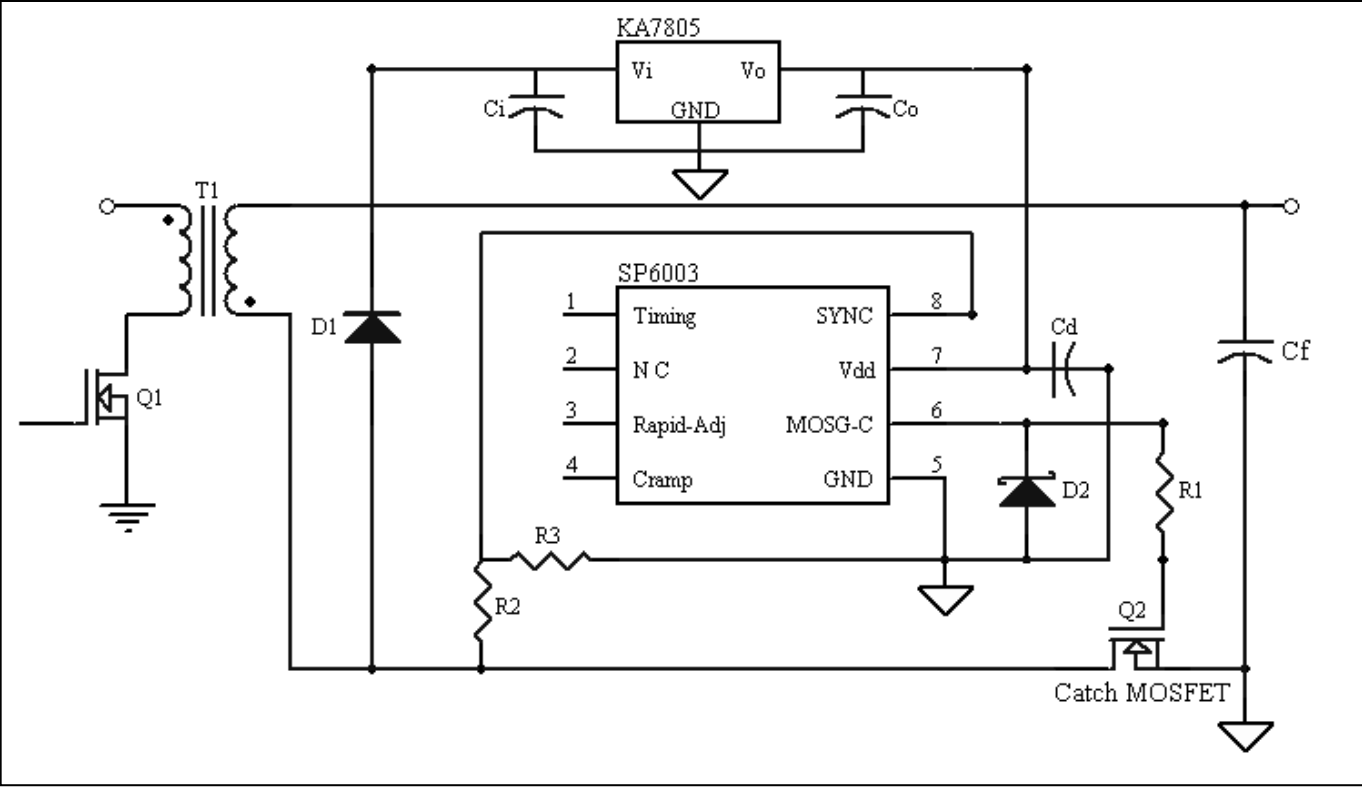


Fig. 1: Typical Application Schematic



# SP6003 Synchronous Rectifier MOSFET Driver

## Typical Flyback Converter Connection:

There are total of 4 main connections, SYNC +, SYNC -, Vout, & GND. The positive side from the output of the transformer should be connected to SYNC +, and the negative side to SYNC -. Vout and GND should be connected to the output capacitor, Cf.

At the bottom side of the reference board, there is a SIP connection of 13 pins.

Here is the pin defines:

Pin 1: External Vdd, is for applications that provides an extra voltage source of DC 5V directly to Pin 7 of SP6003. (Note: This is an optional pin.)

Pin 2-4: SYNC +, connects to positive secondary side from the output of transformer.

Pin 5-7: SYNC -, connects to negative secondary side.

Pin 8-10: Vout, positive output, connects to Cf.

(Note: Cf, R2, and R3 are not included in the demo board.)

Pin 11-13: GND, ground connection.

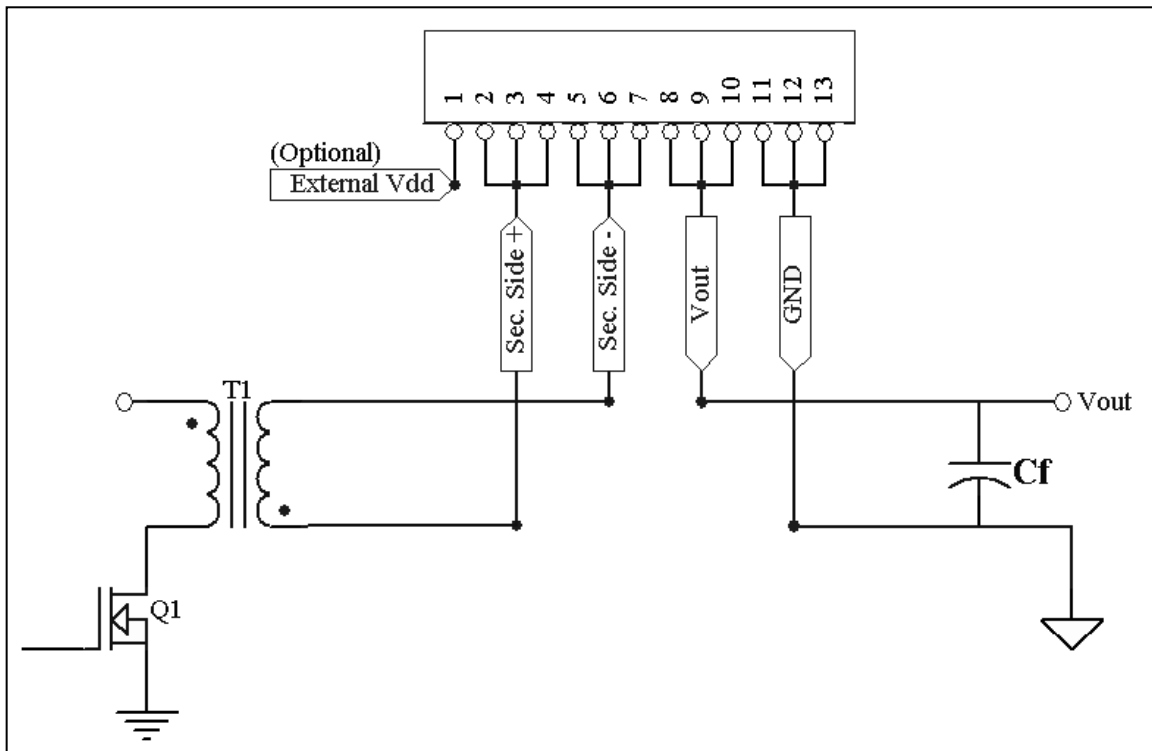


Fig. 2: Pin Connections



# SP6003

## Synchronous Rectifier MOSFET Driver

### Board Layout:

The following figures designate the layout and hole indications on front/back sides of this demo board:  
(4 x actual size)

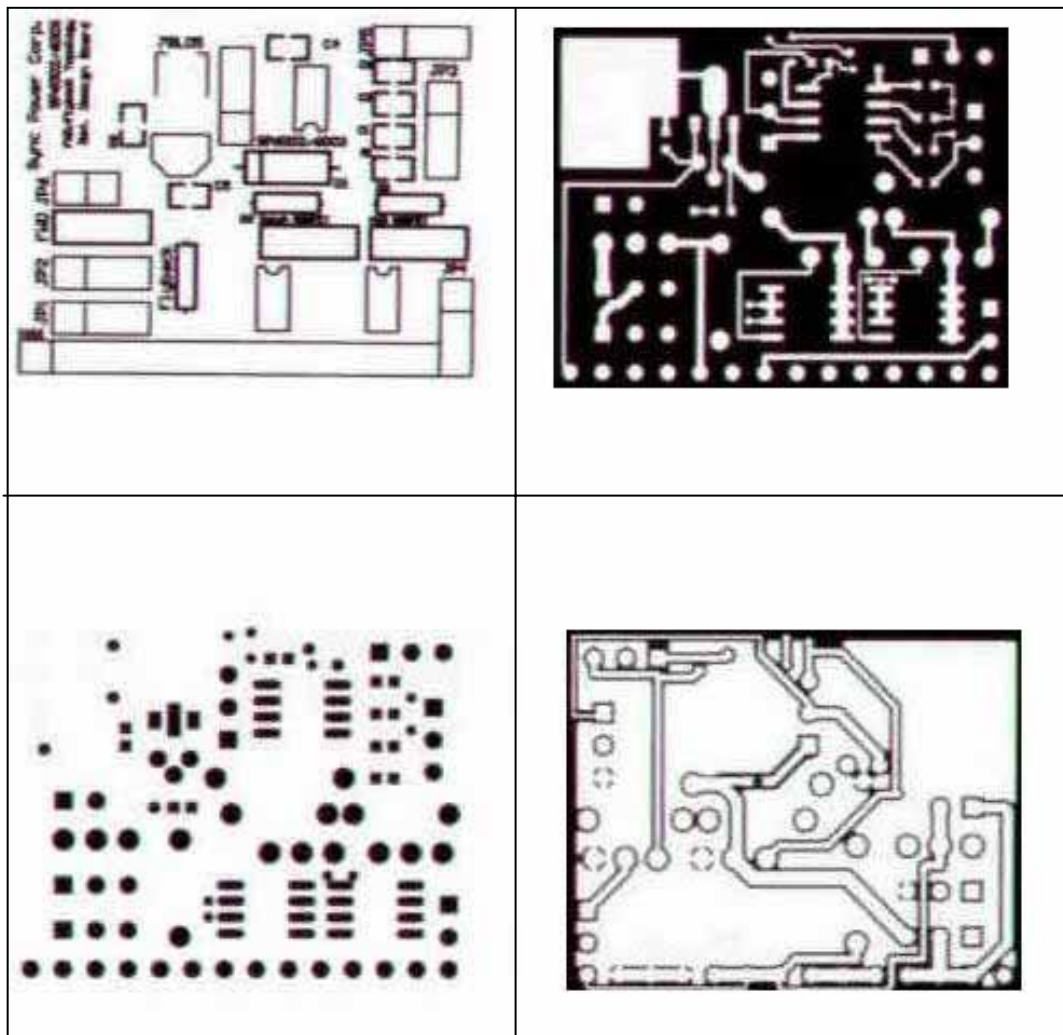


Fig. 3: Layout & hole indications on both sides.



# SP6003

## Synchronous Rectifier MOSFET Driver

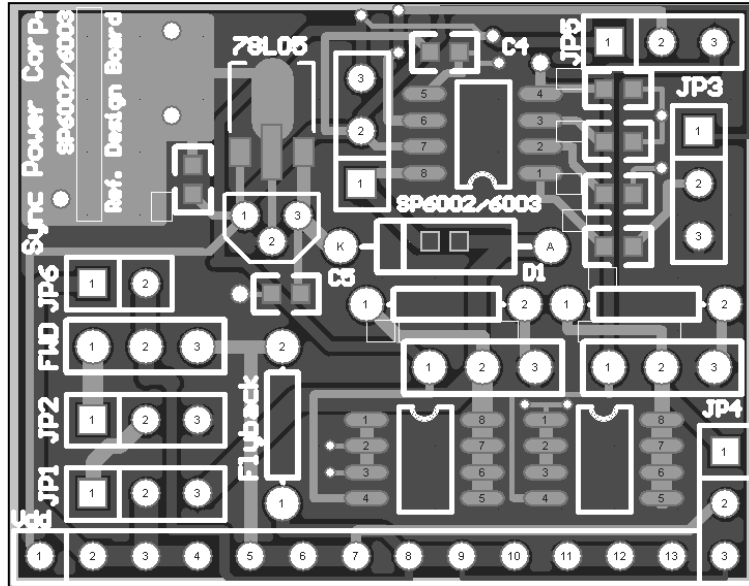


Fig. 4: Board Layout with two sides combined.

### Timing ( $T_{dv/dt}$ ) adjustment:

The option for Timing adjustment is at JP 3. Pin 2 is connected to the other side of R1; pin 1 is tied to Vdd, and pin 3 to ground. This adjustment is purely application dependent, so R1 is left open with no resistor connected. Typical application should connect 10-25K resistor to Vdd or ground, depends on its timing.

As a reminder, for all connector pins in this demo board, the pin with the square pad indicates Pin 1, and then Pin 2 and 3 follows respectively.





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## Optional Correlations:

There are a total of 4 options, each with its own set of jumper connections.

Flyback Converter: JP1, Pin 2-3.

JP2, Open.

JP4, Pin 2-3.

JP5, Pin 2-3.

JP6, Open.

FWD Converter (SP6002): JP1, Pin 2-3.

JP2, Open.

JP4, Pin 1-2.

JP5, Pin 1-2.

JP6, Closed.

Flyback Converter w/o SP6003: JP1, Pin 1-2.

JP2, Pin 2-3.

FWD Converter w/o SP6002: JP1, Pin 1-2.

JP2, Pin 1-2.

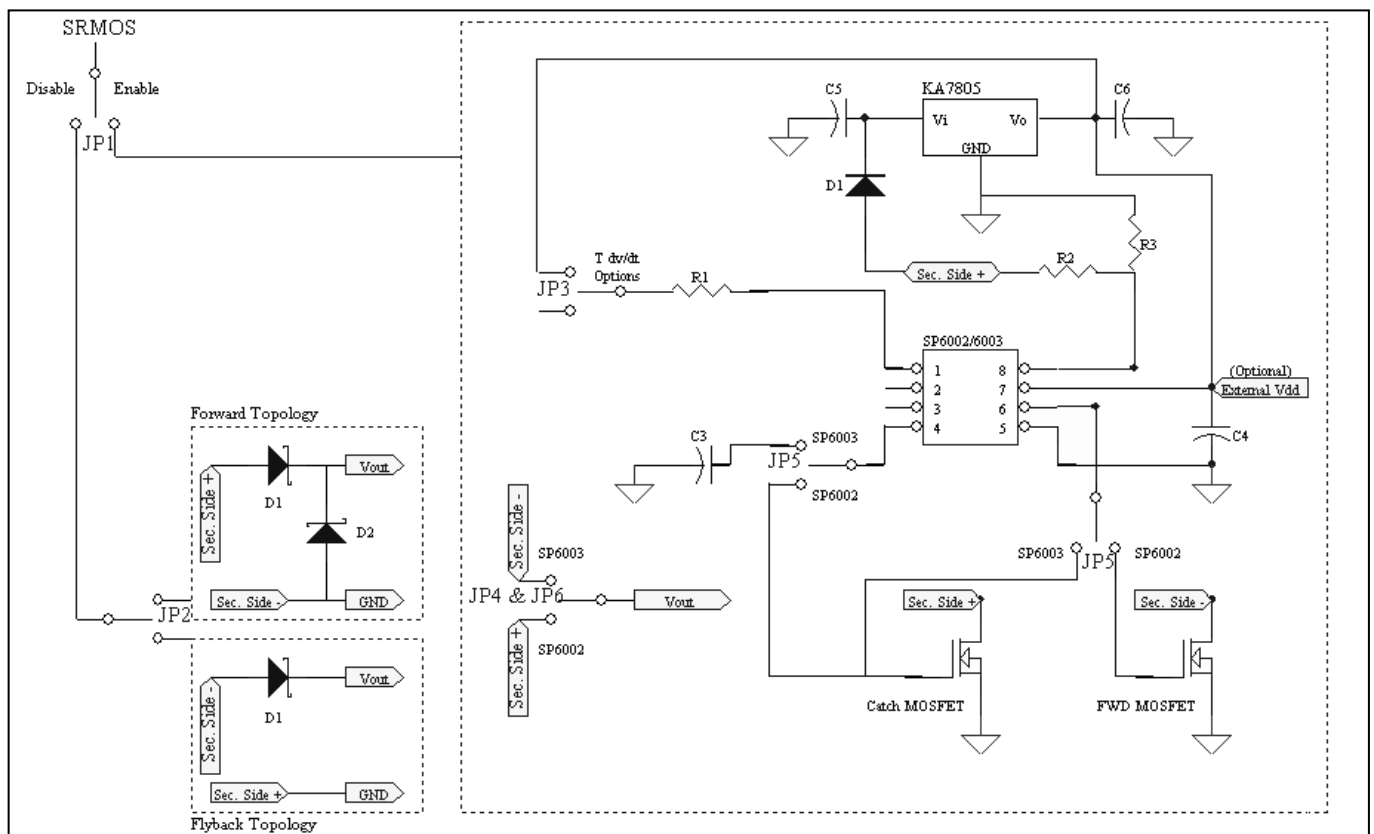


Fig. 5: Jumper Settings.



# SP6003

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