

# Forward/Flyback V1

This is a Simplis simulation model of a 36V to 72V input sync. rect. Forward converter with the reset winding on the secondary side. The output voltage is 5V and capable of up to 30A output. The PWM is a UC3845 by Unitrode. This converter model shows the AC loop response for a Forward/Flyback topology which an average model is difficult to develop for. Also under certain conditions this model shows the short coming of the circuit.

To better view the schematic, do the following from the SIMetrix command shell to set up the fonts for the text:

File → Options → Font → Schematic – user 1 → Arial,Bold,14

File → Options → Font → Schematic – user 2 → Times New Roman,Bold,22

The following are simulation circuits:

**Forward\_Combo.sxsch** - This finds the periodic operating point, then performs an AC analysis and last performs a load transient of 10A at 20usec. Takes 1:25 min to run on a 1Ghz machine.

**Forward\_Startup.sxsch** - This performs a soft start on the circuit. Takes 2:24 min to run on a 1Ghz machine.

The components include the following. The internal schematic can be viewed by highlighting the component, and clicking on Hierarchy → Descend Into

**Gen\_Opto.sxcmp** - This is a general purpose model of an opto-coupler.

**Gen\_Driver.sxcmp** - This is a general purpose model of a MOSFET driver.

**Output\_Inductor.sxcmp** - This is a model of the output inductor with a self bias winding to power the primary side circuitry. For simulation that require POP, an initial condition must be supplied to the inductor within the model. Set the value to the total load current at t=0. Please note that the + mark for polarity must be towards the transformer and not towards the load.

**Output\_Inductor\_NoIC.sxcmp** - This is a model of the output inductor with a self bias winding to power the primary side circuitry. For soft-start simulation that requires no POP, the initial condition must set to 0 for the inductor within the model. Please note that the + mark for polarity must be towards the transformer and not towards the load