

Switching Loss Example V1

This is a Simplis simulation model of a 400V input Forward. The output voltage is 12V and capable of up to 10A output. This simulation shows switching loss on Q1.

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

To examine switching loss, run the simulation. This simulation will run POP and show 5 switch cycles at steady-state. Look at the drain voltage and current to view the waveforms on Q1. To look at the power loss on Q1, select Probe → Power in Device on the SIMetrix schematic toolbar and when the pointer changes to a probe then click on Q1. To obtain the power loss per cycle, check the box next to Power(Q1) on the graph. Then click on AVG button on the graph toolbar.

For this to exhibit switching loss, the MOSFET model must be a level “1032”. This can be found by right clicking on the device and selecting edit properties. This model includes piecewise linear capacitors for the drain to source and gate to drain capacitances.

The following are simulation circuits:

Switching_Loss_Example.sxsch - This finds the periodic operating point and displays 5 switch cycles.

The following are required models to run the simulation circuits: The internal schematic can be viewed by highlighting the component, and clicking on Hierarchy → Descend Into

Gen_Opto.sxcmp - This is a component model of a general purpose opto.