# Speed Control Model

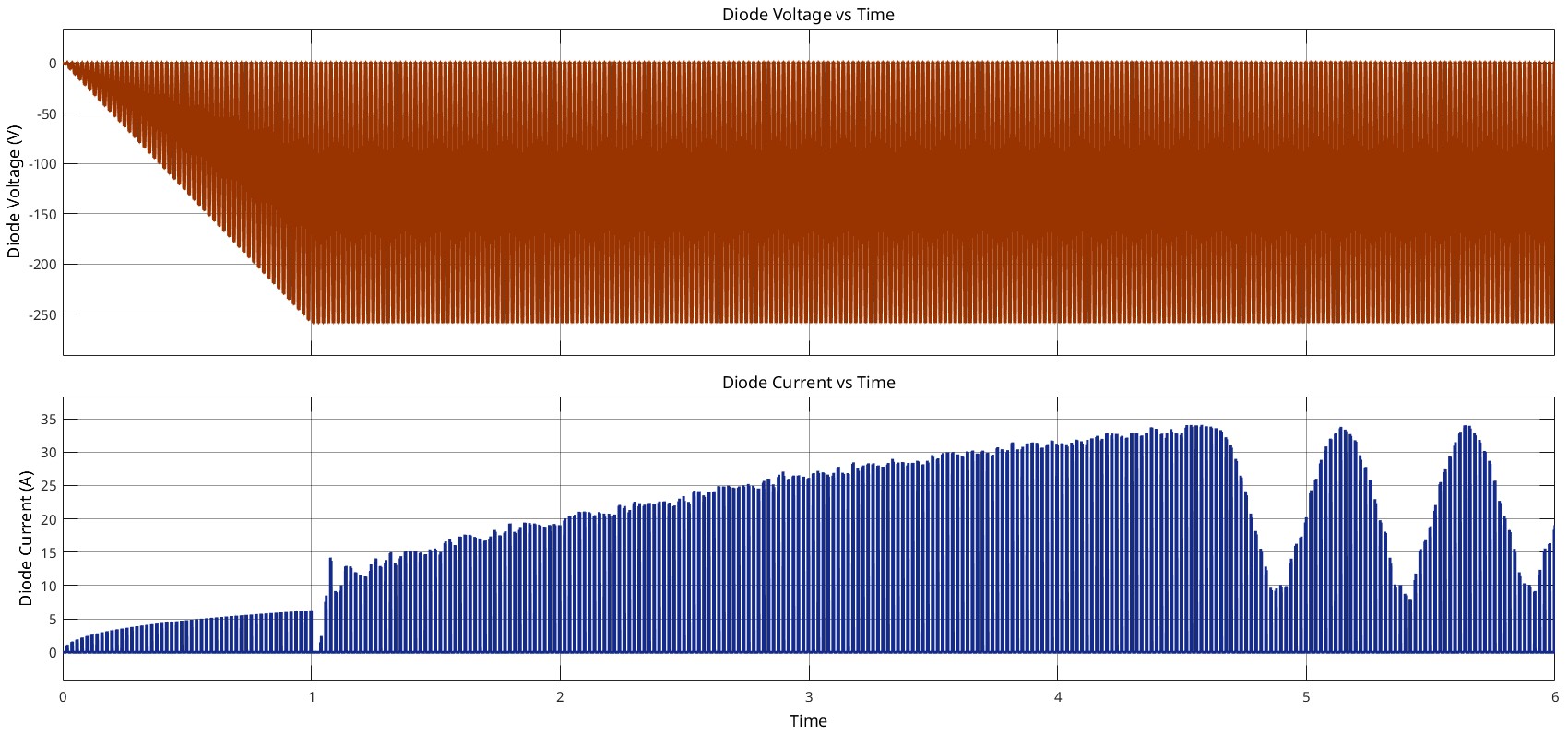


Figure x: Voltage and Current on the Diode

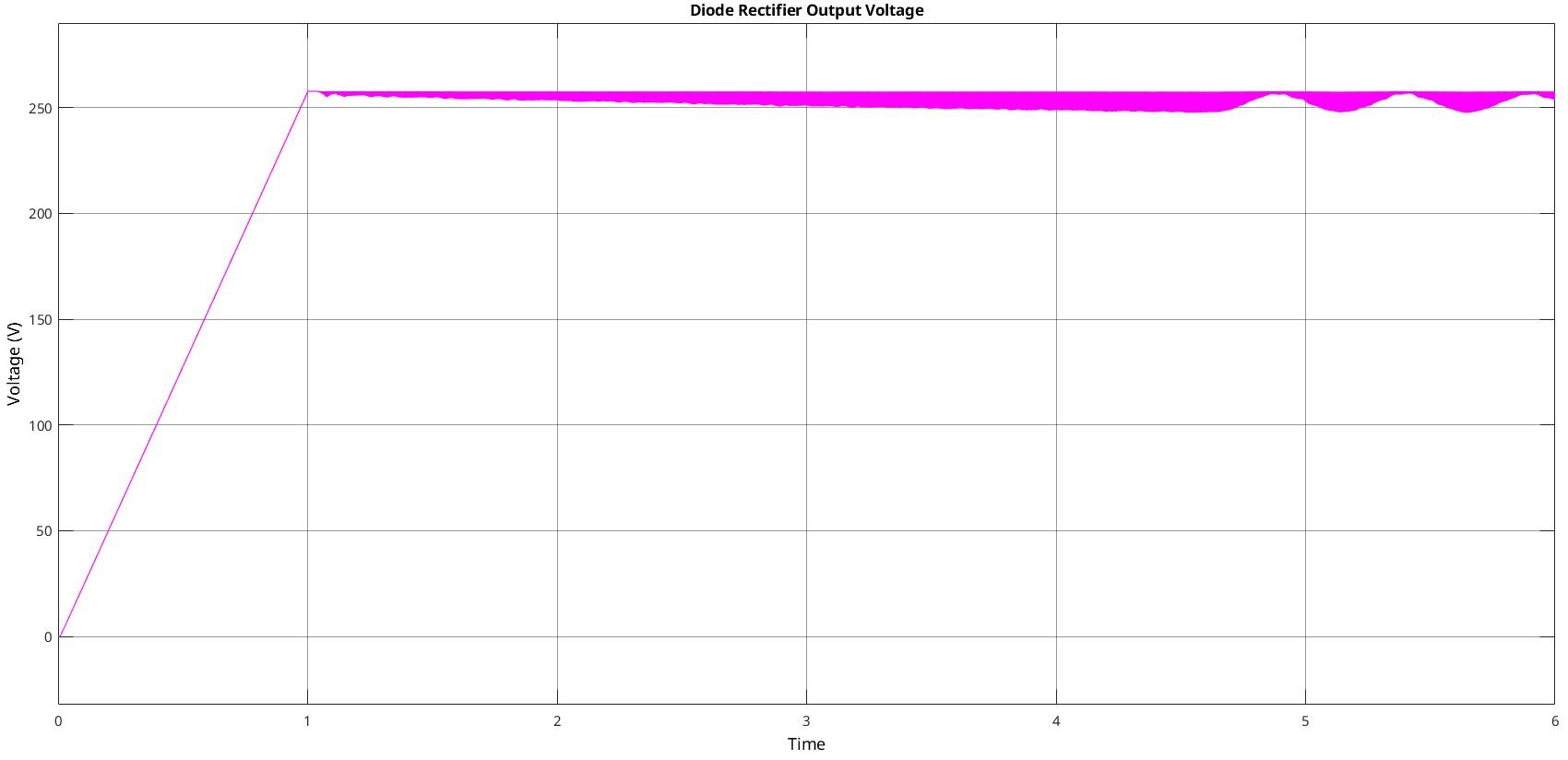


Figure x: Rectifier Output Voltage

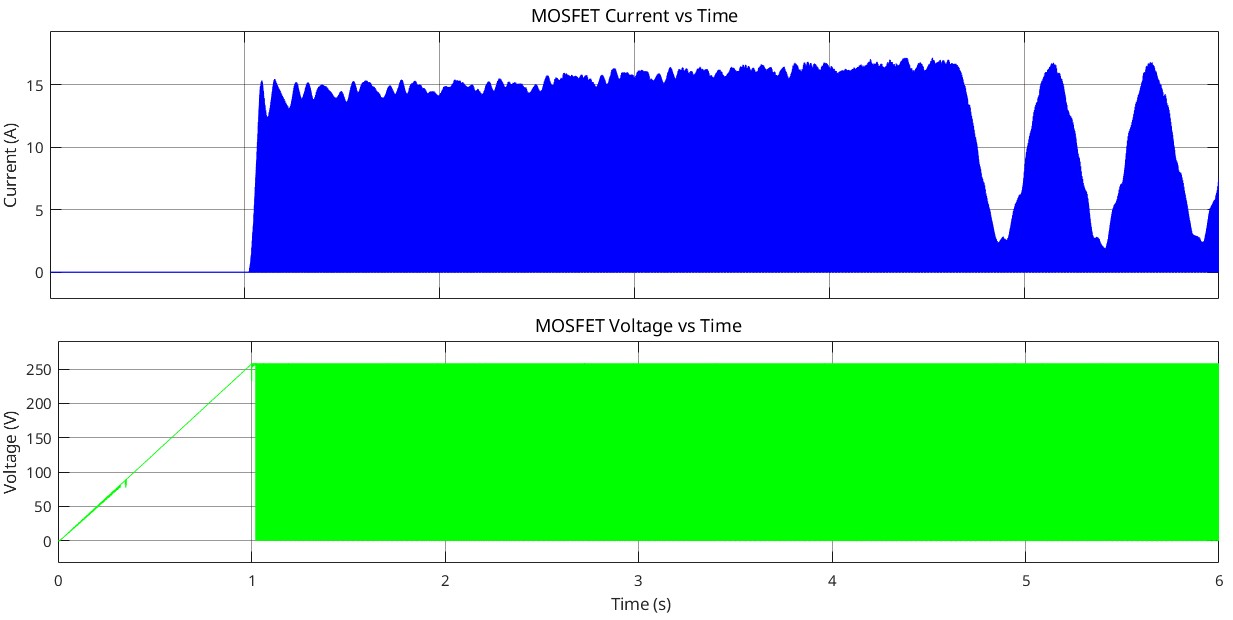


Figure x: Voltage and Current on the MOSFET

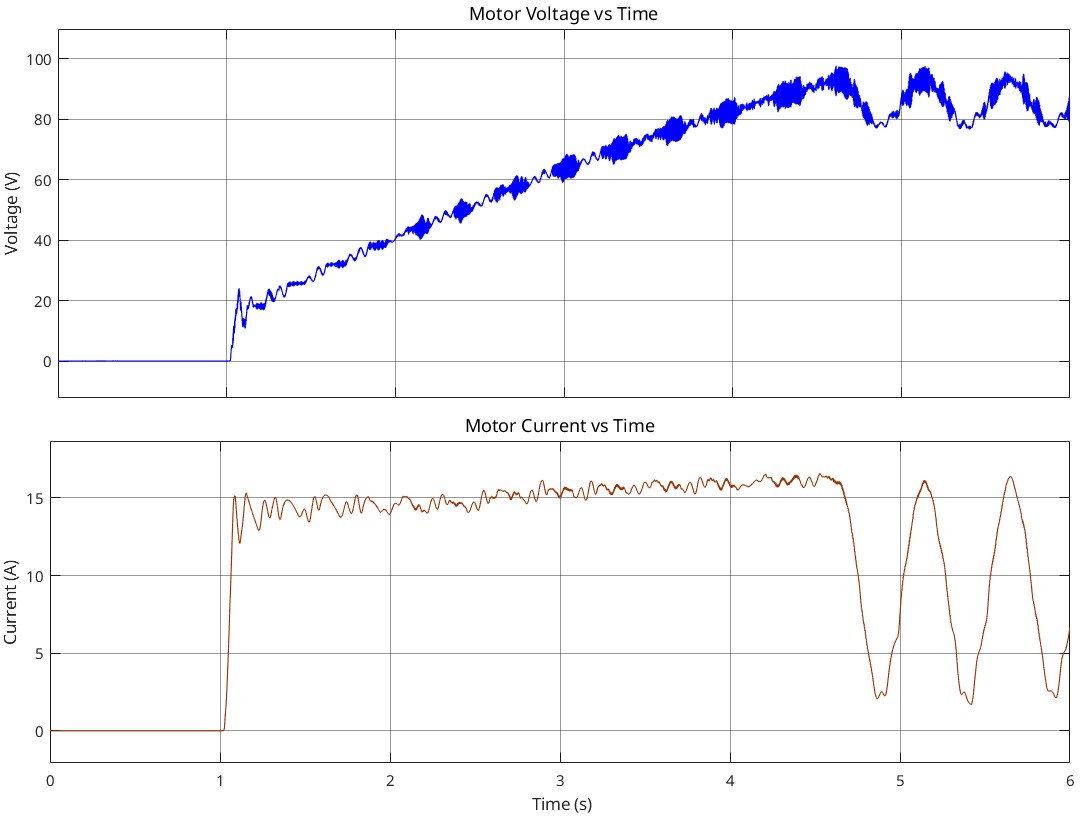


Figure x: Voltage and Current on the Motor

(ripples after the 4.5s is caused by speed oscillations around 150 rad/s speed controller should be optimized)

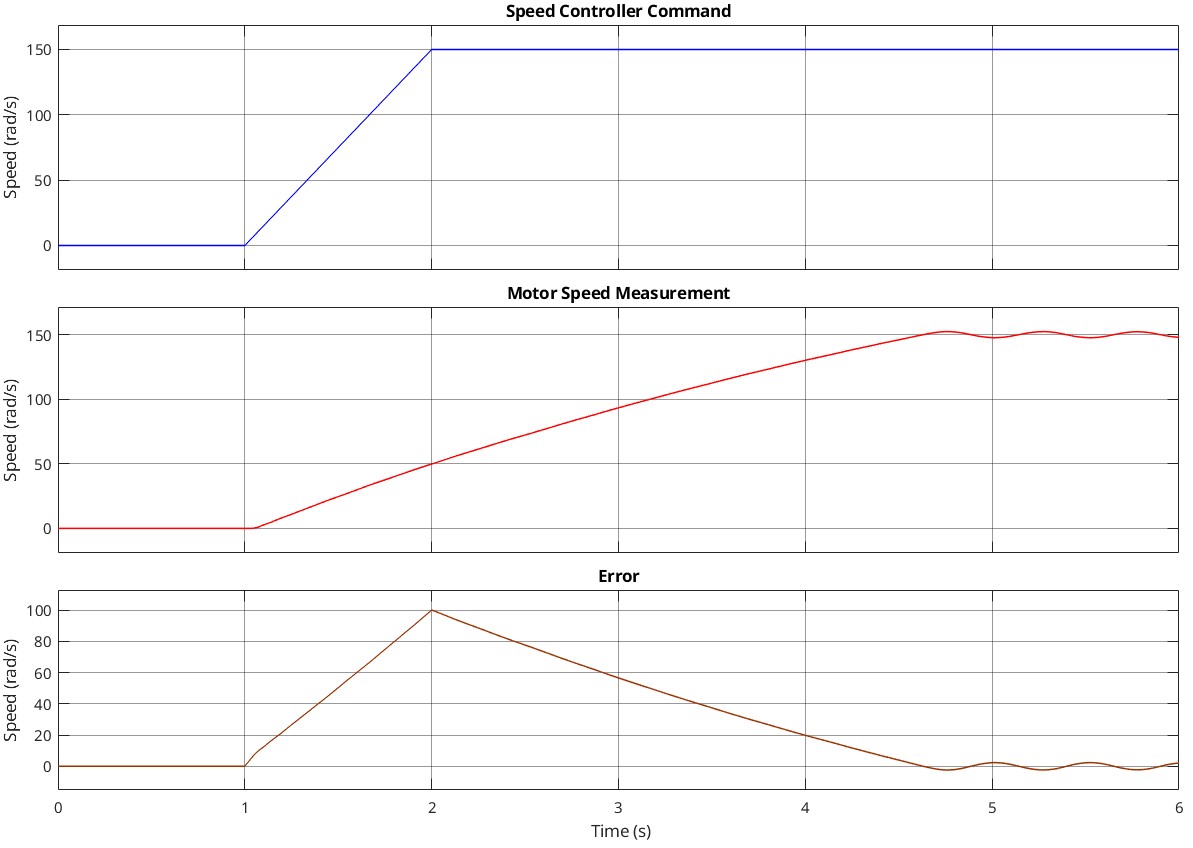


Figure x: Speed Controller Command, Measurement, and Error

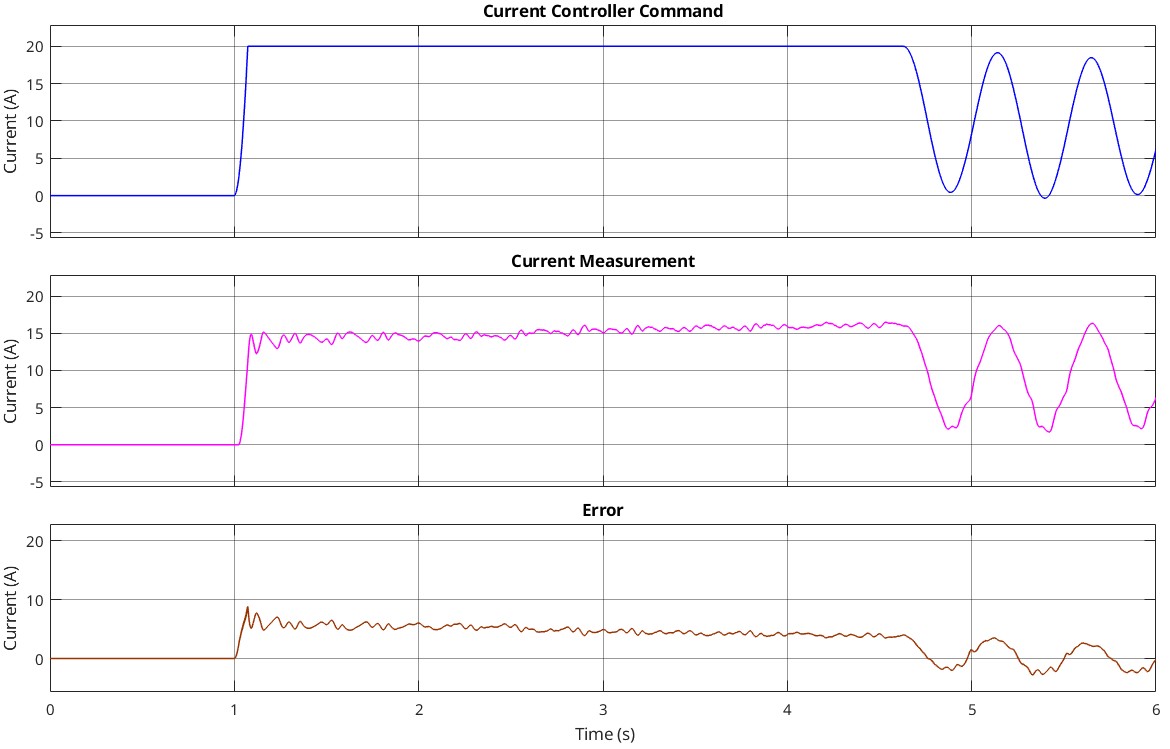


Figure x: Current Controller Command, Measurement, and Error

# Generator Model

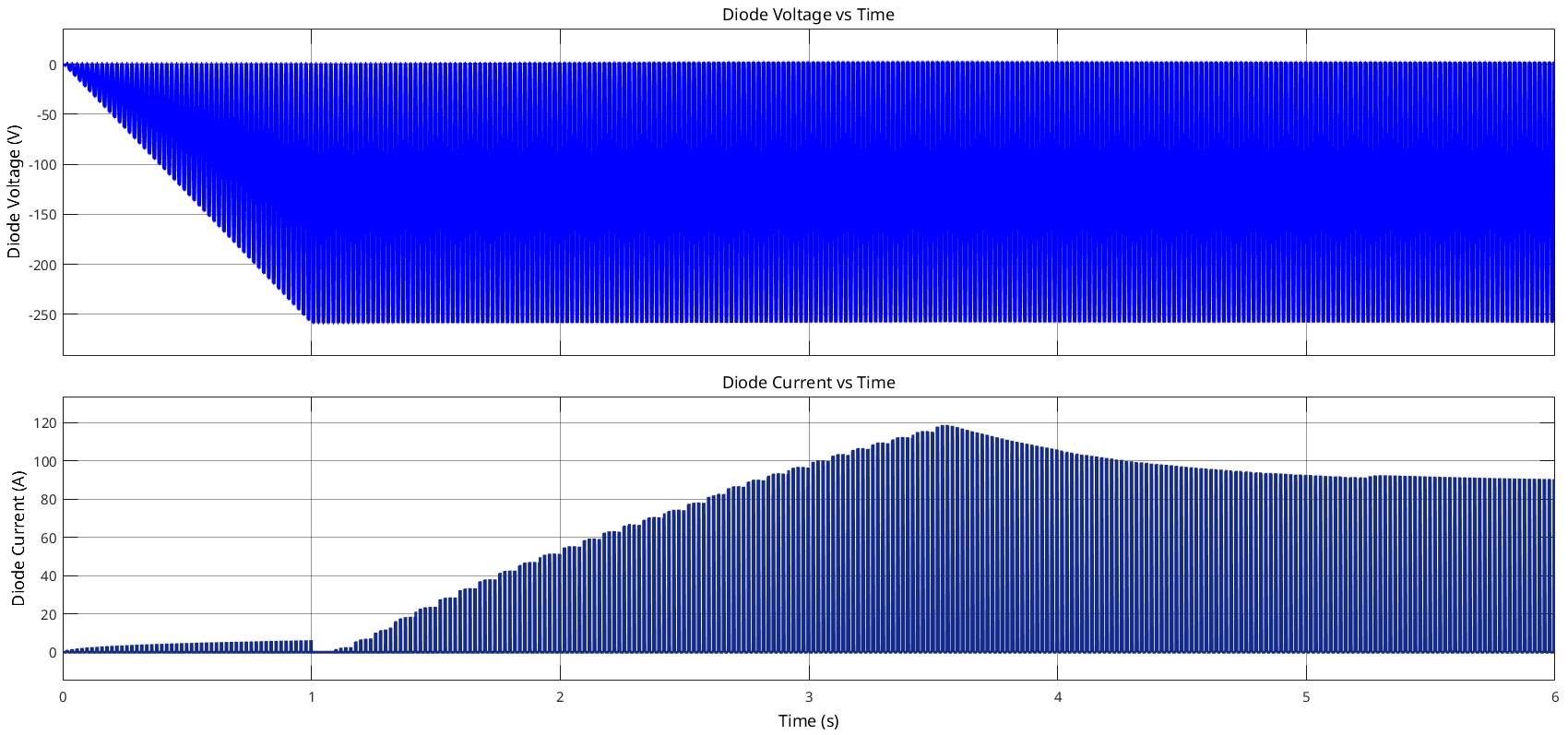


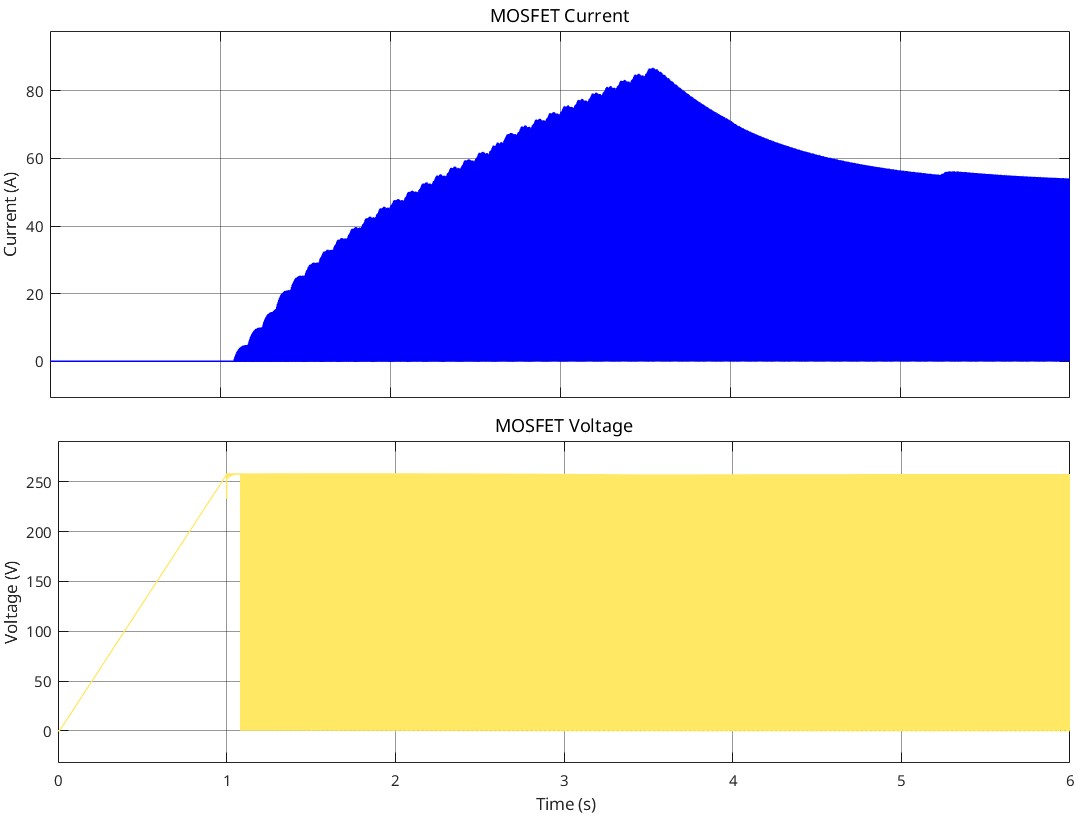
Figure x: Voltage and Current on the Diode

Figure x: Voltage and Current on the MOSFET

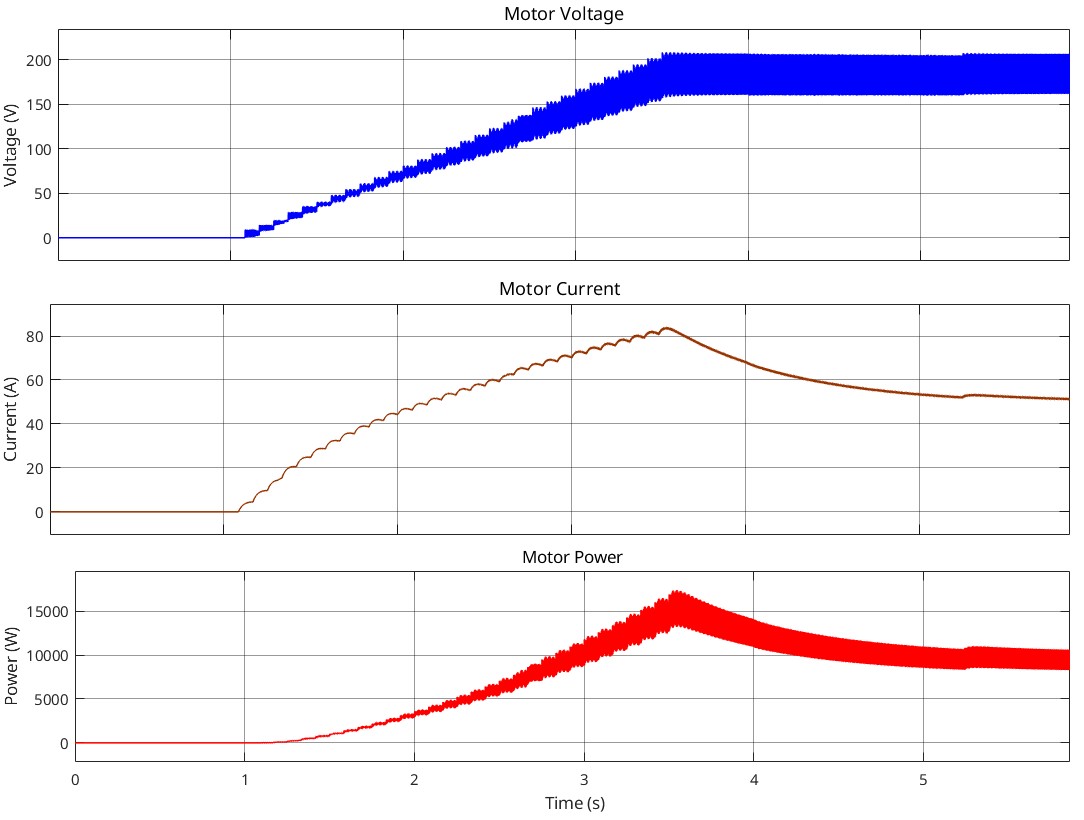


Figure x: Voltage, Current, and Power of the Motor

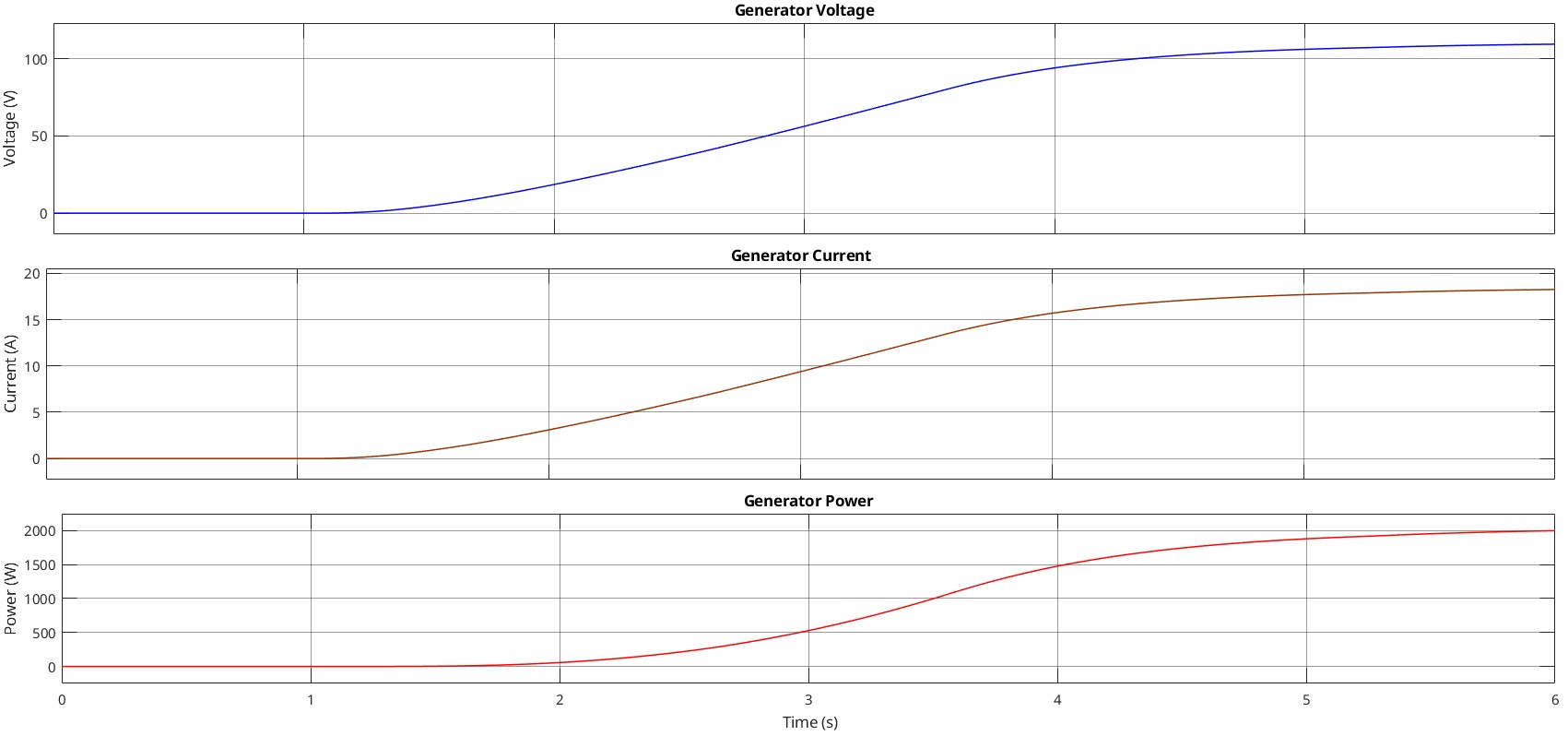


Figure x: Voltage, Current, and Power of the Generator

(motor current is not limited in this model however since the current rating of the motor is 23A this current should be limited which will cause output power to be even less. Furthermore diode mosfet currents will be more realizable like in the speed controller. Due to assumed parameters in motor and generator the loss is great and only 2kW can be generated from 10kW)

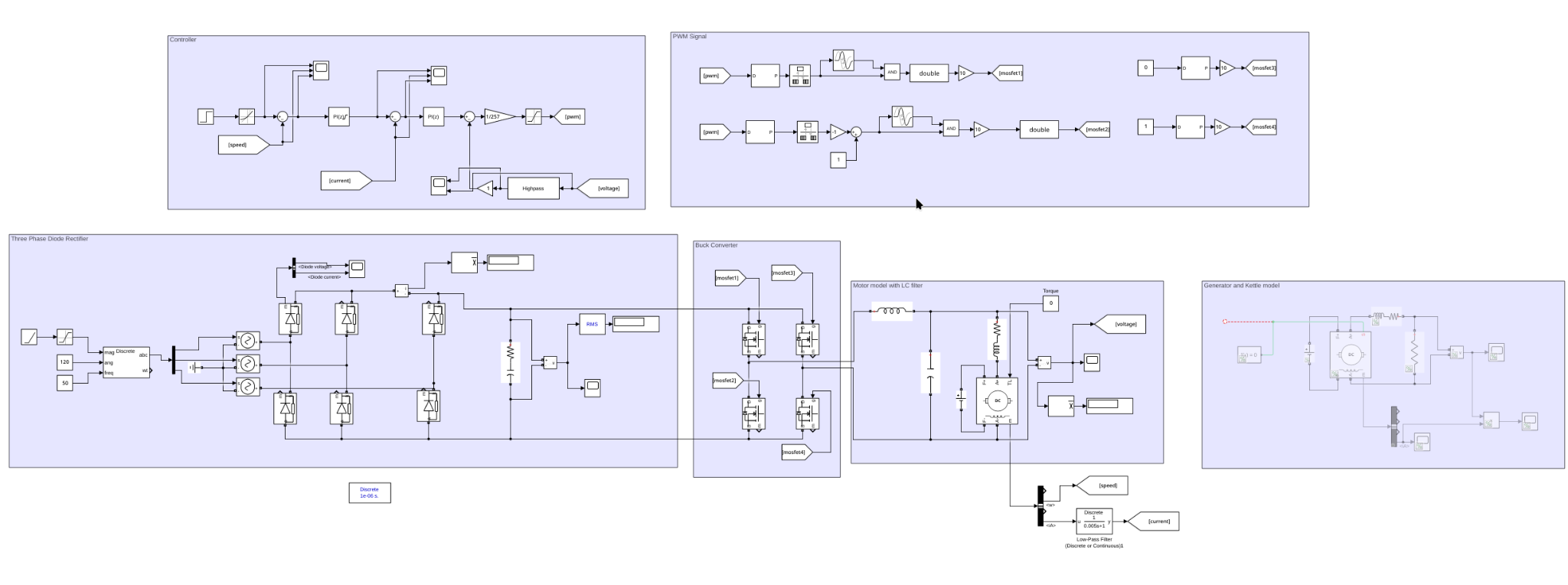


Figure x: Simulation Model for Speed Control

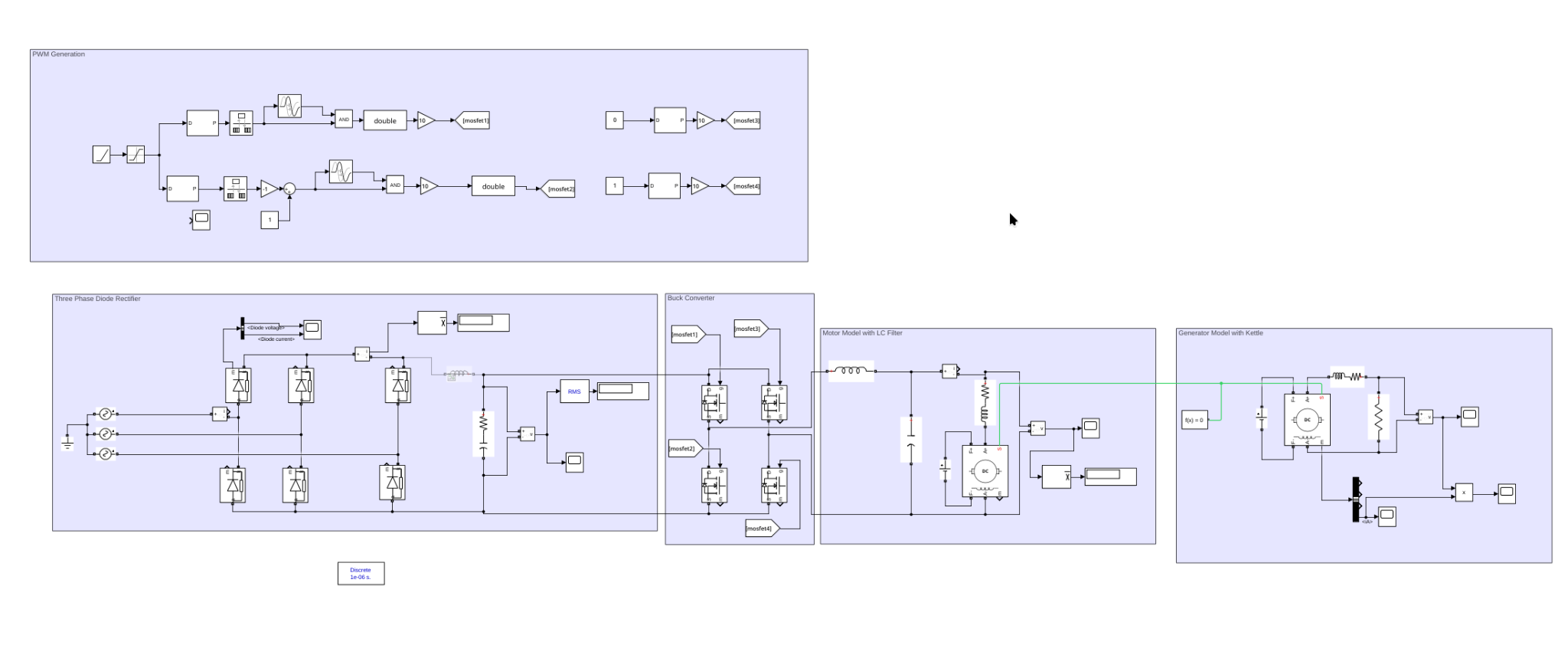


Figure x: Simulation Model for Generator