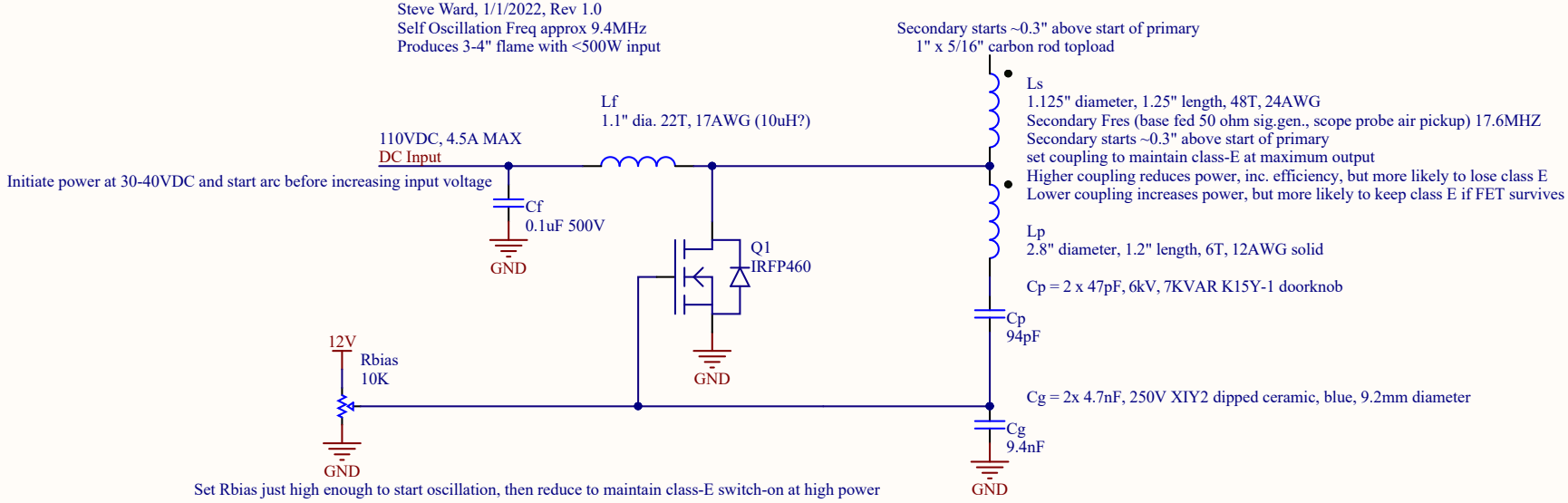
HFDRSSTC with IRFP460

Steve Ward, 1/1/2022, Rev 1.0
Self Oscillation Freq approx 9.4MHz
Produces 3-4" flame with <500W input



Operating Instructions

1) before applying power, install >30awg "arc starting" wire, ~1" long, on the carbon rod.
*This wire will burn away quickly, leaving the arc on the surface of the carbon rod.
**Starting the coil without the starting wire could result in MOSFET destruction from overload.
***If the arc is "blown out" or lost, this can also result in MOSFET overload/destruction.

(Alternately, the arc can be drawn off the carbon electrode with a small bit of insulated metal.
Input voltage must be low (30-40V) to reduce chance of MOSFET failure, while starting the arc.)

2) Set Rbias to ZERO output voltage.
3) Set DC input to 30-40V. Carefully increase the Rbias setting to increase gate voltage.
Eventually oscillation will start at ~3.4V in my test with 35VDC input.
4) For operation up to 120VDC, I reduce gate bias to ~2V which provides extra phase
advance and helps maintain class-E switching with high plasma power loss.
5) Safe shut-down: reduce DC input voltage to 30-40V, then turn Rbias down to zero.

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