# AC-dipole Basic Design

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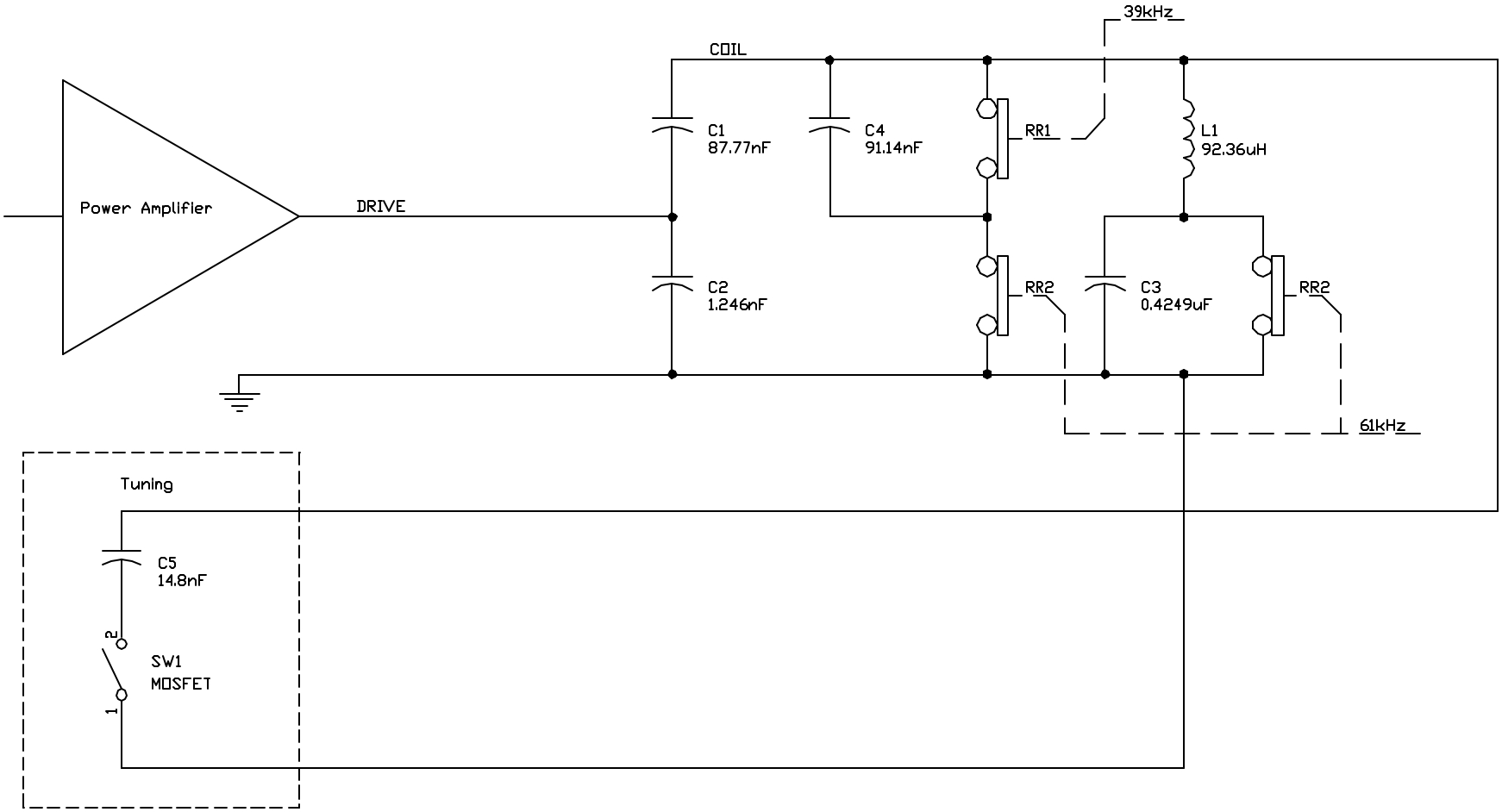
# Assumptions

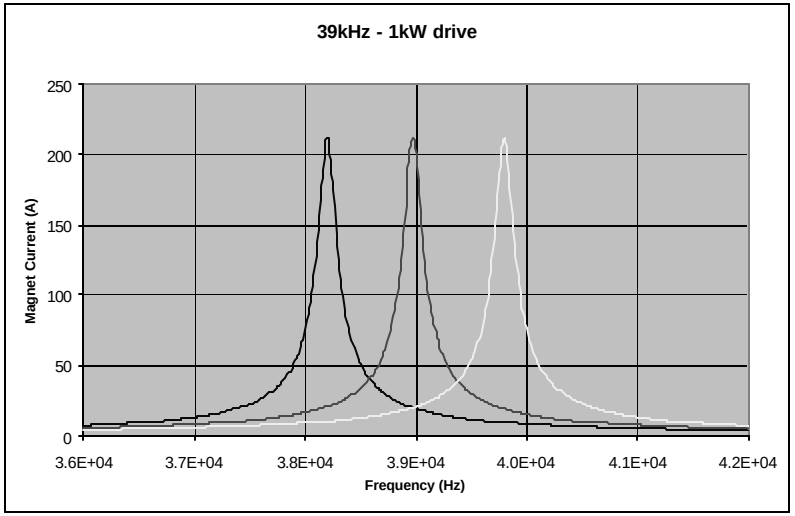
- 92.36µH inductance from 3D model
  - 100Gm @ 120A
- Estimated power dissipation, Q, and $R_S$ based on existing magnet
  - 319W, Q=510, 44.4mO @ 39kHz
  - 534W, Q=478, 74.1mO @ 61kHz
- Tuning is a function of reactive power
  - $VA_{TUNING}=VA_{LC}*(1-(F_{LO}/F_{HI})^2)$

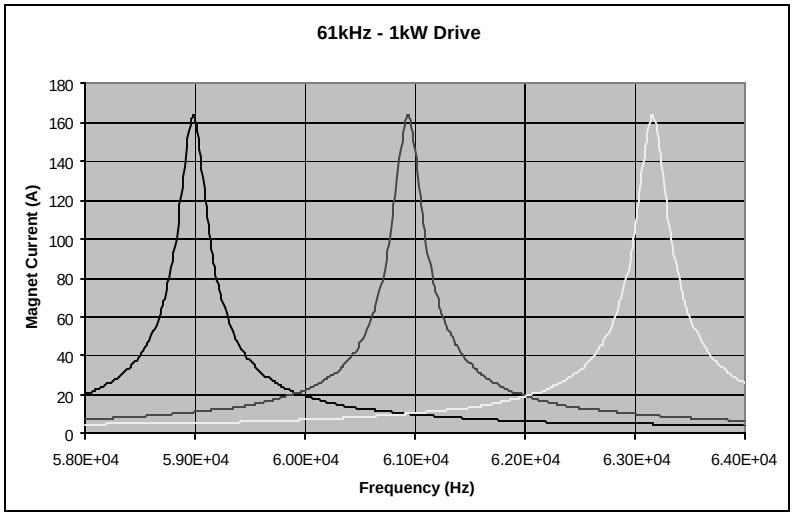
# Basic Circuit



# Simulated Performance

- Sufficient current headroom at 1kW
  - 212A @ 39kHz
  - 161A @ 61kHz
- ? F wider at 61kHz
  - ? F ±800Hz @ 39kHz
  - ? F ±2090Hz @ 61kHz
- 50O ±5O impedance over range
- $V_{PK} < 5kV_{PK}$



# Next Step

- Test tuning at 1kW
  - Complete test setup
  - Complete FPGA code & software driver