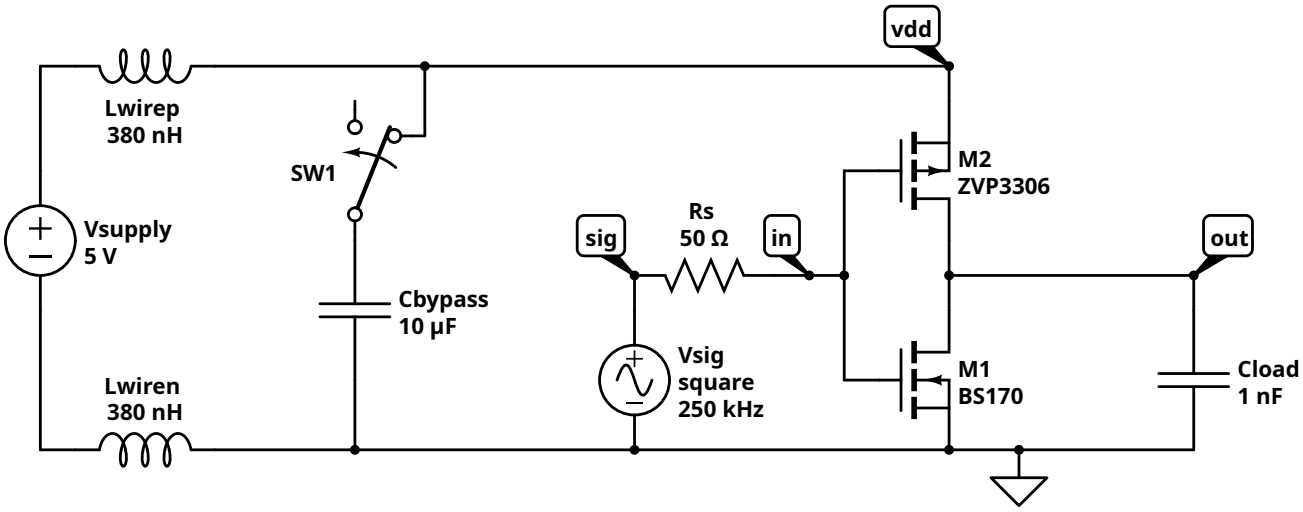
Inverter transient responses

1. CMOS inverter



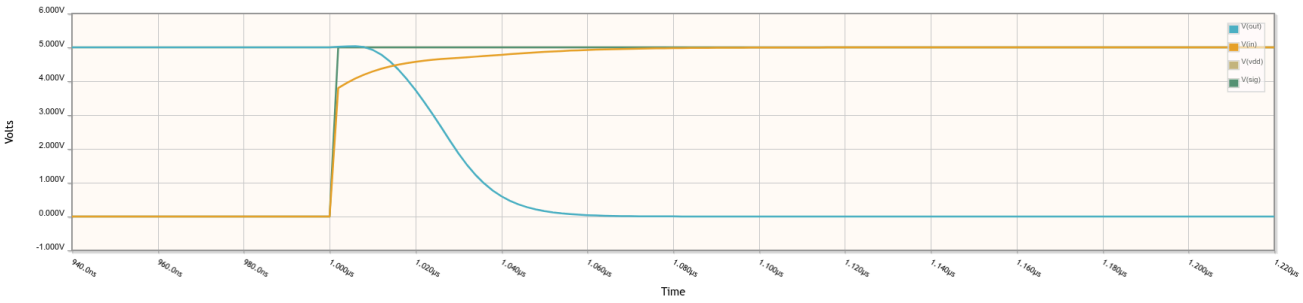
1.1. Output high → low transition

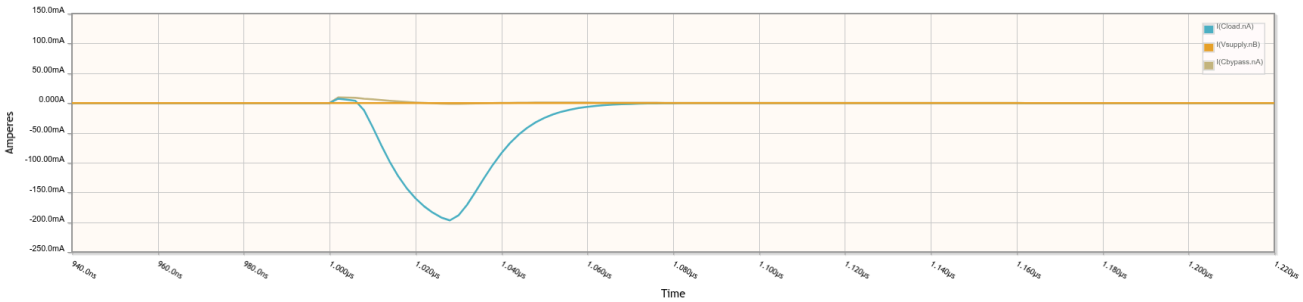
Solve the DC circuit voltages for when `V(sig)` is 0 V:

- `V(in) =` _____ and `V(out) =` _____

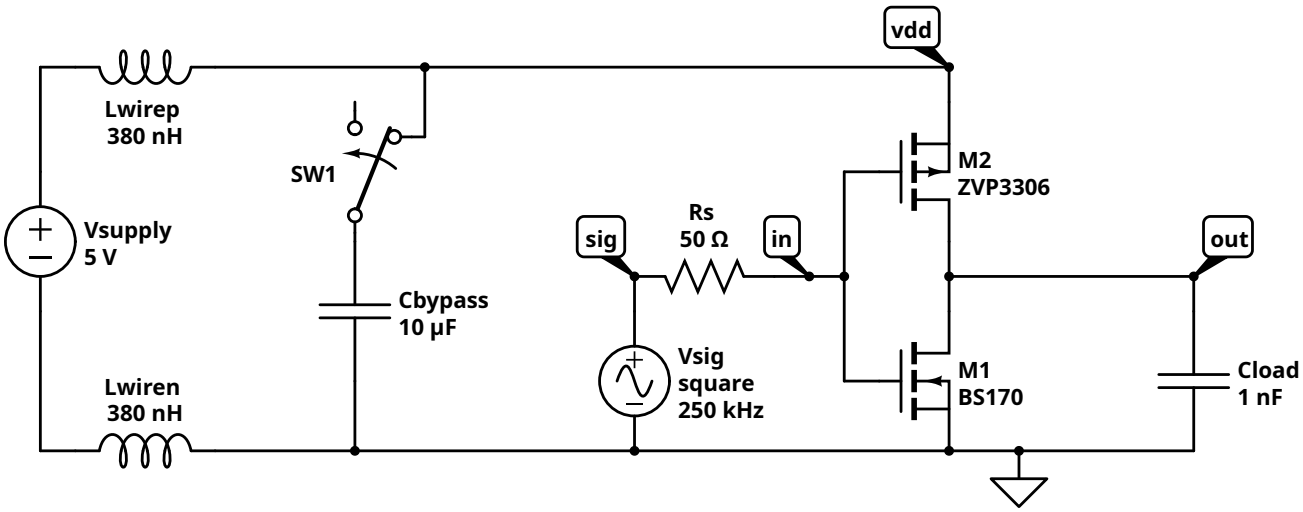
Now `V(sig)` immediately rises to 5 V. Assume that `SW1` is closed, including `Cbypass` in the circuit. At that moment^{+}:

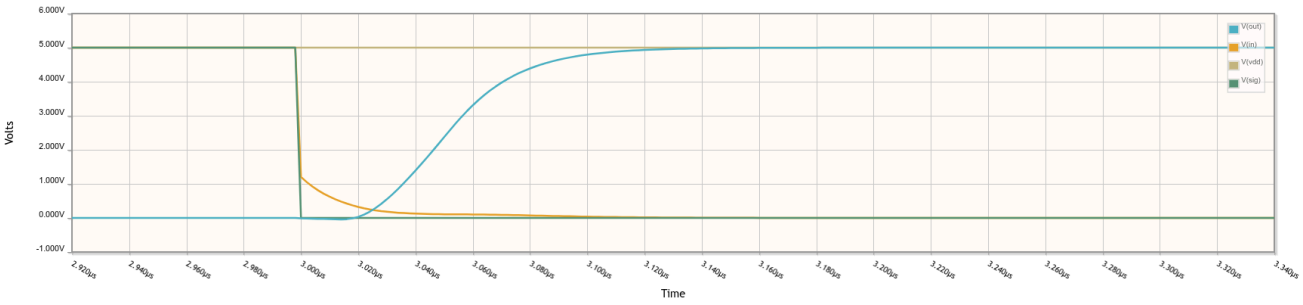
- **M1** operating mode: _____, **M2** operating mode: _____
- Notate the currents and the expected voltage waveform shapes.

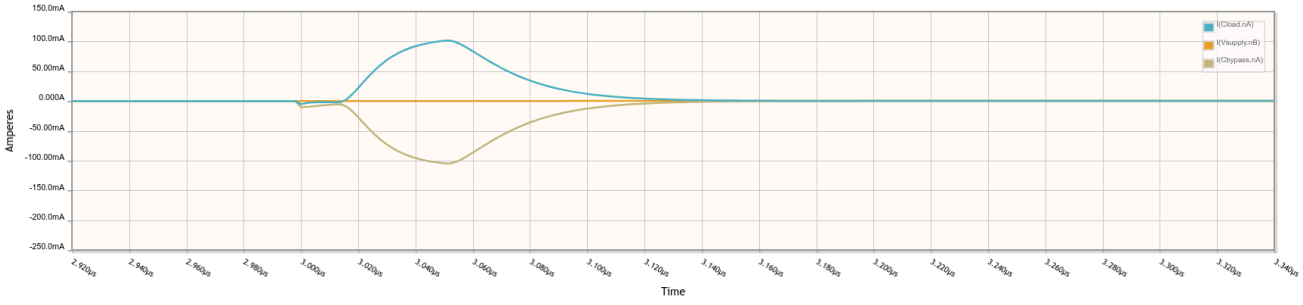




1.2. Output low → high transition

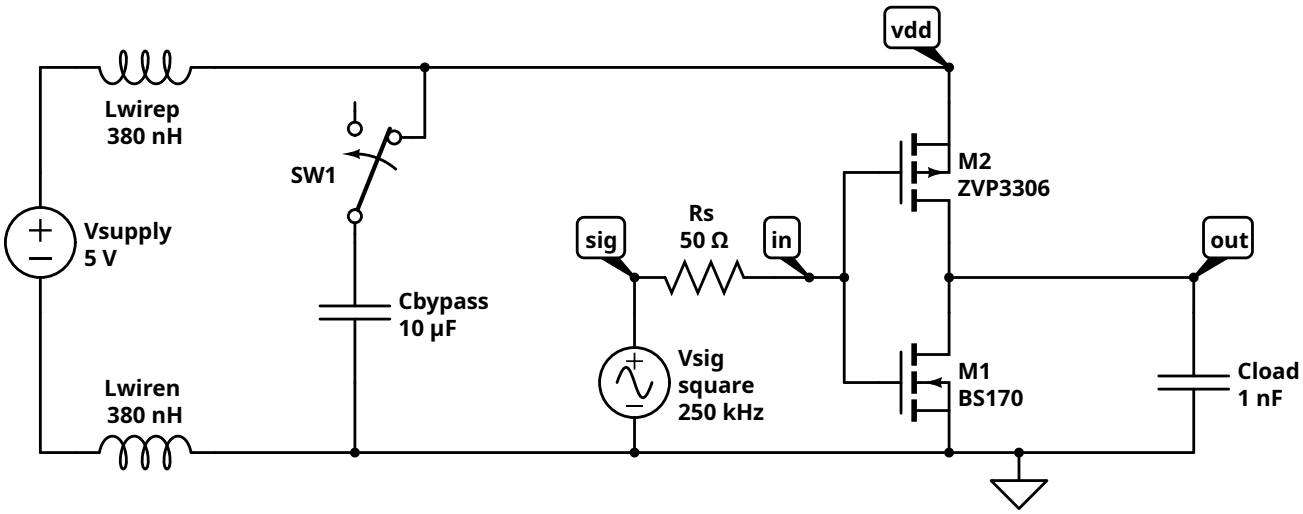


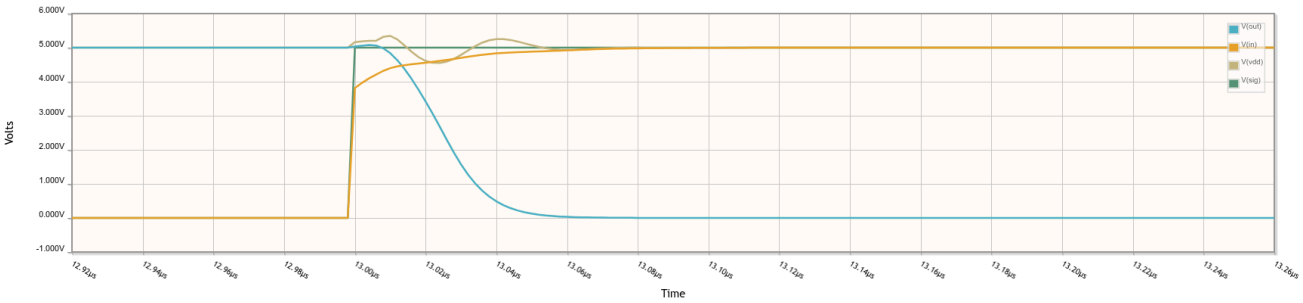


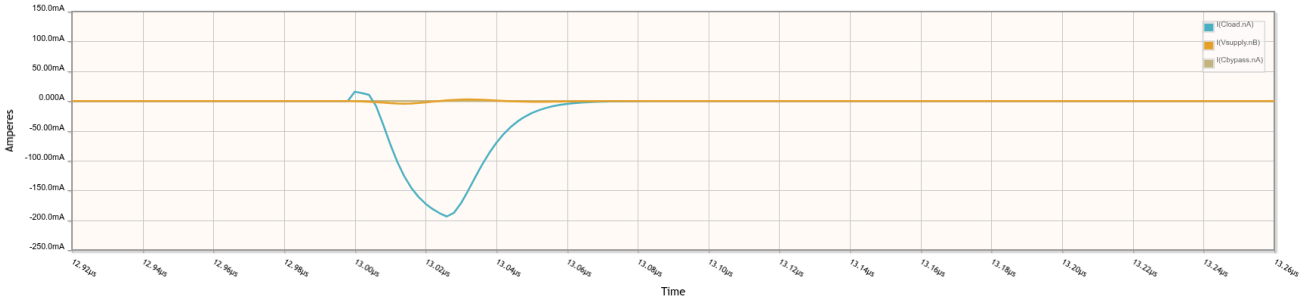


1.3. No Cbypass: Output high → low transition

Open `SW1` to remove `Cbypass` from the circuit. This forces current to flow directly from the power supply through the (long) leads.







1.4. No Cbypass: Output low → high transition

Open `SW1` to remove `Cbypass` from the circuit. This forces current to flow directly from the power supply through the (long) leads.

