

Preamp in voltage mode

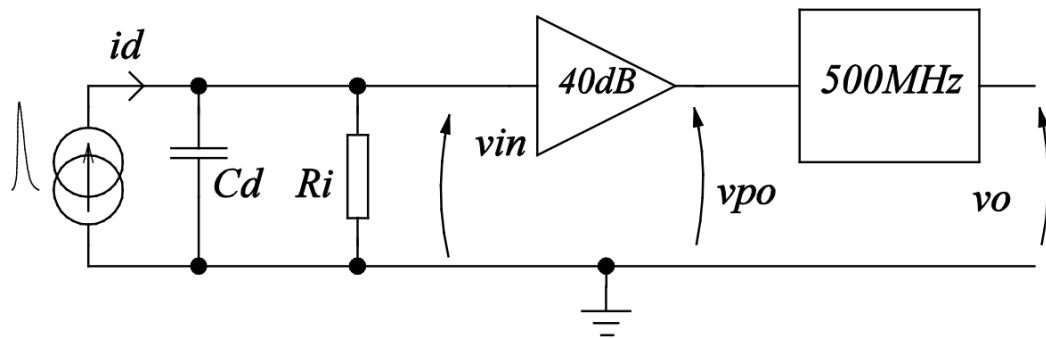


Fig1. Preamplifier working in voltage mode.

Response $v_o(t)$ can be found solving following equations.

Voltages:

$$v_{in} = i_d \frac{1}{s C_d + \frac{1}{R_i}} = i_d \frac{R_i}{1 + s C_d R_i} \qquad v_o = v_{in} K u(s) = v_{in} \frac{K u}{1 + s \tau_{P0}}$$

Where τ_{P0} defines bandwidth of the amplifier (for 500MHz 3dB bandwidth $\tau_{P0} = 0.32\text{ns}$)