

ECE345 Midterm Project Report

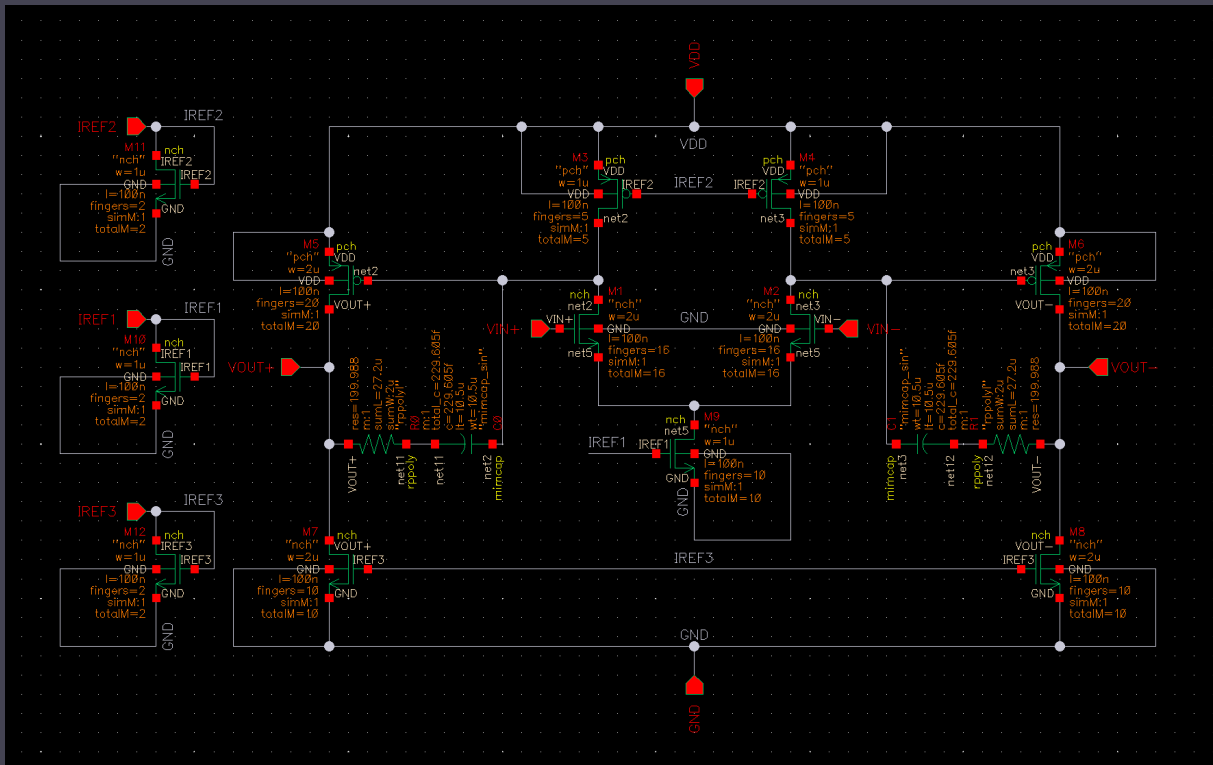


Figure 1: Original Schematic

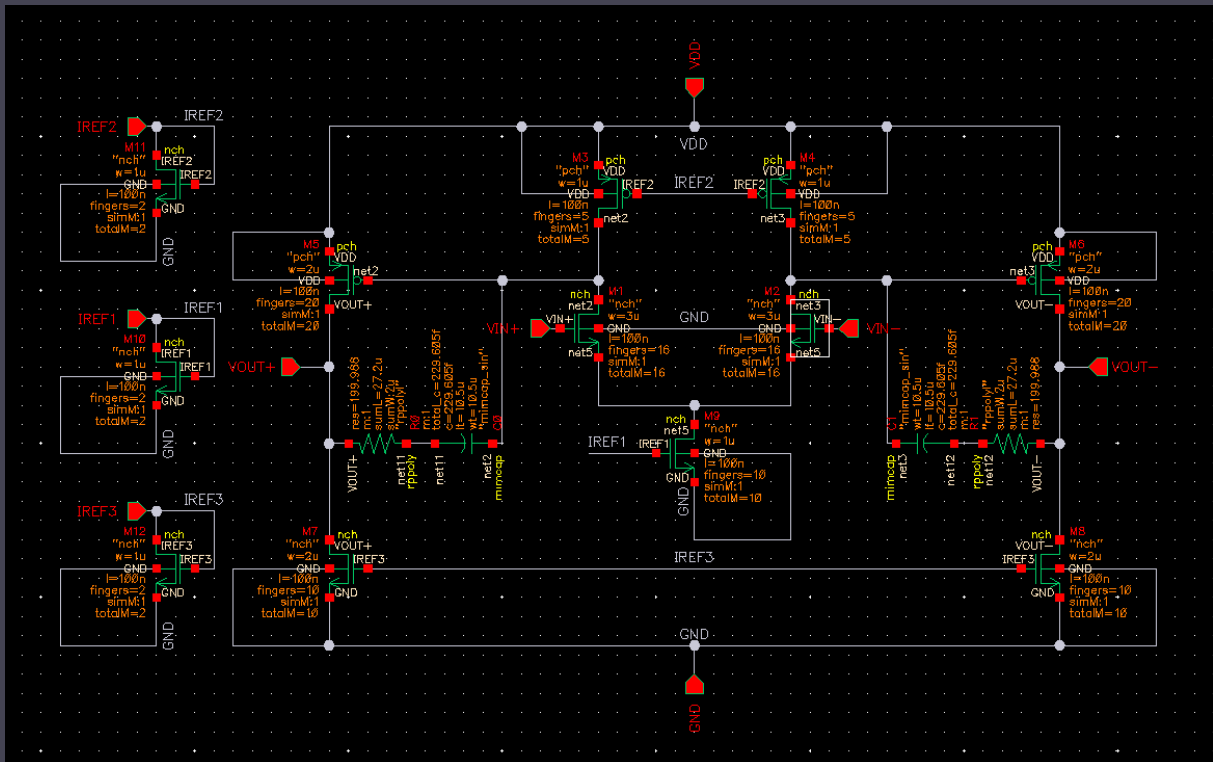


Figure 2: Noise Optimized Schematic

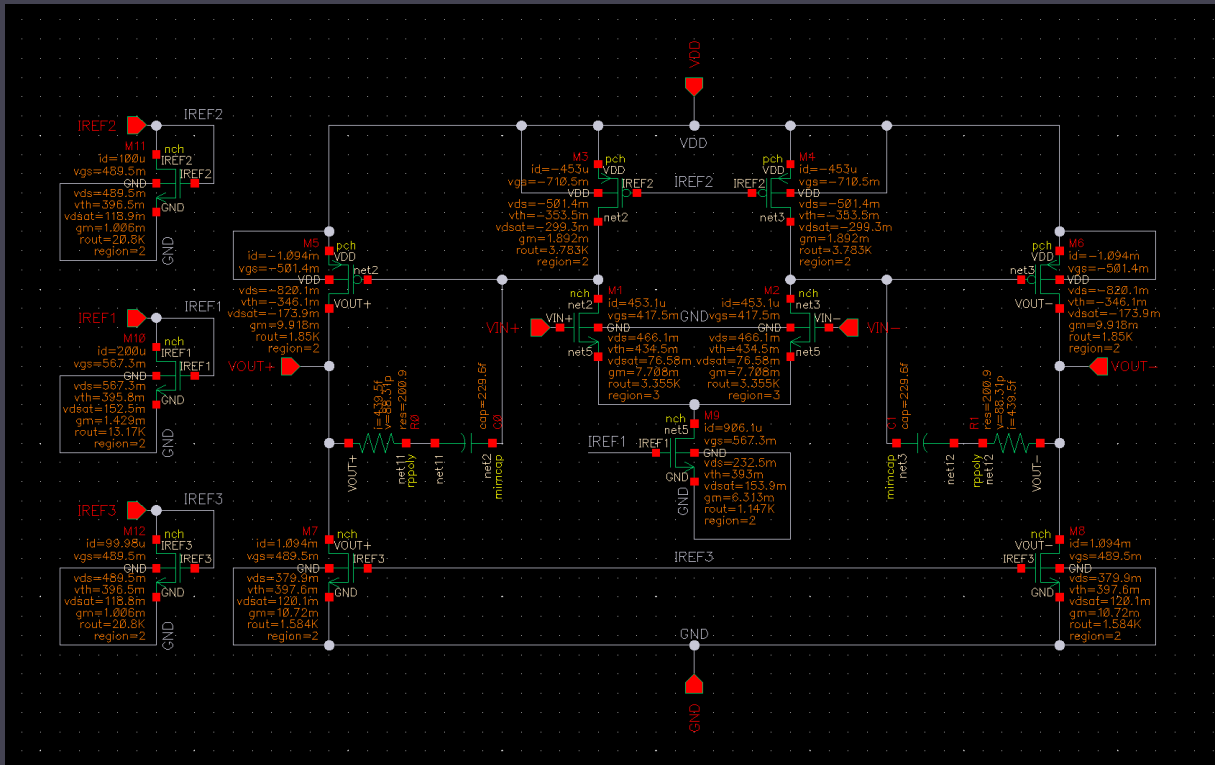


Figure 3: Original Schematic with DC Operating Points

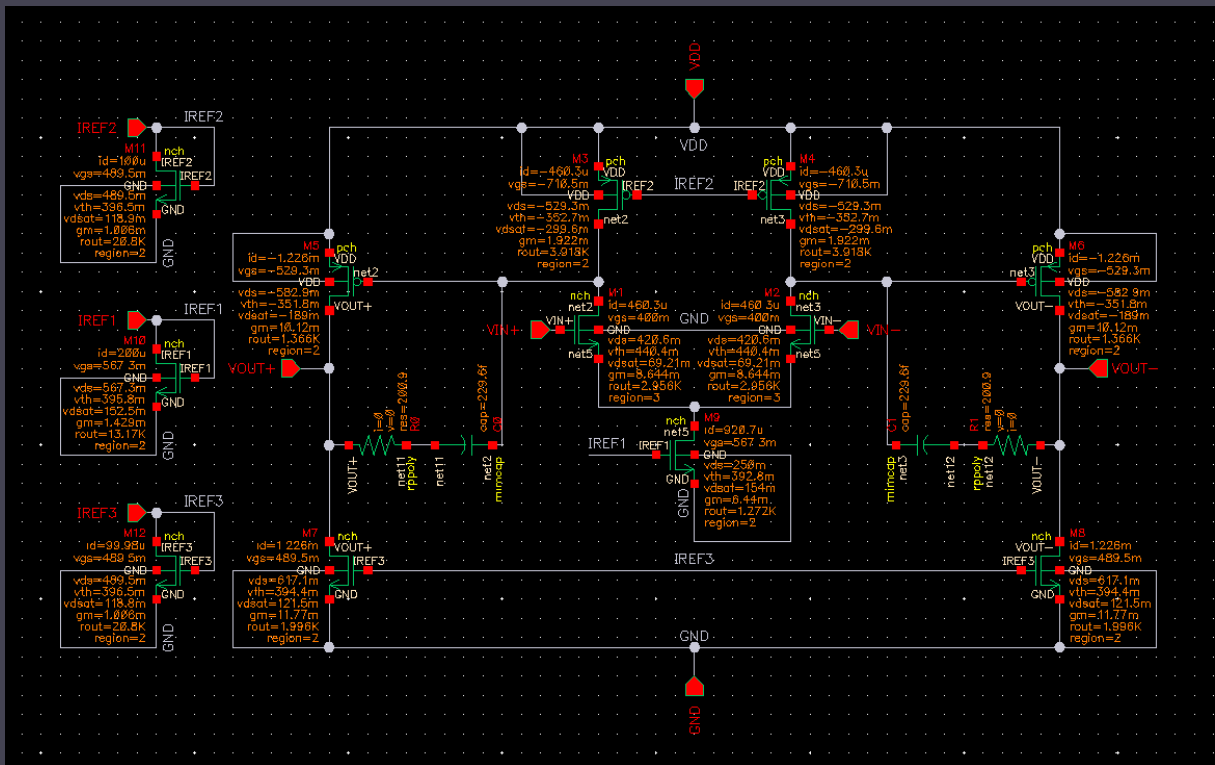


Figure 4: Noise Optimized Schematic with DC Operating Points

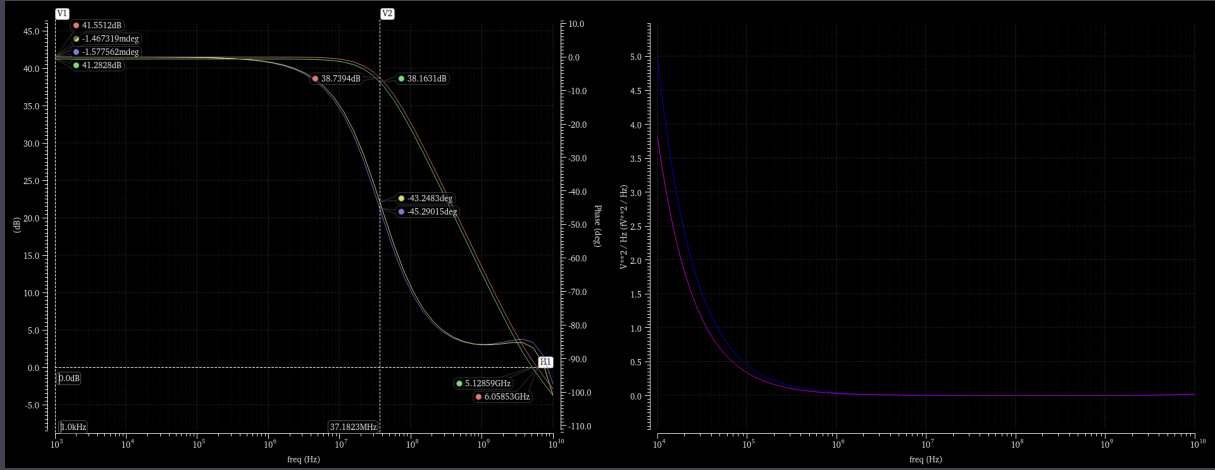


Figure 5: Frequency Response Comparison

Increasing the width of M1 and M2 from 2μ to 3μ resulted in a 12.4% RMS reduction in total input-referred noise.

Specification	Target	Original	Noise Optimized
Gain @ Low Frequencies	>40 dB	41.28 dB	41.55 dB
Unity Gain Frequency	>5 GHz	5.13 GHz	6.06 GHz
Phase Margin	>60°	94.85°	91.31°
Peak-to-Peak Amplitude	400 mV	906 mV	831 mV
Power Consumption	<4.5 mW	4.19 mW	4.53 mW
Total Input Referred Noise	NA	5.16e-10 V ² /Hz	3.96e-10 V ² /Hz

Table 1: Specifications