3) Correlation admittance

$$Y_c = \frac{\overline{V_{neq}^*}\,\overline{i_{neq}}}{\overline{V_{neq}}^2}$$

$$\approx j\omega C_{gs} \leftarrow \text{same as without } L_s \text{ (see lecture note, page-65)}$$

4) Uncorrelate noise current

$$\overline{i_{nu}} = \overline{i_{neq}} - Y_c\,\overline{V_{neq}}$$

$$= -j\omega C_{gs}\,\overline{V_{ng}} \leftarrow \text{see lecture note, page-65}$$

correlated noise current

$$\overline{i_{nc}} = \overline{i_{neq}} - \overline{i_{nu}}$$

4) Optimum admittance

$$Y_{opt} = \omega C_{gs}\sqrt{\frac{g_m R_g}{r}} - j\omega C_{gs} \leftarrow \text{see lecture note page-66}$$

5) Fmin

$$F_{min} = 1 + 2\omega C_{gs}\sqrt{r\frac{R_g}{g_m}} \leftarrow \text{see lecture note page-67.}$$

Think about why these results are same as in the case of without source inductor