$P_{qnoise} = \int_0^{f_B} \frac{\Delta^2}{12} \frac{2}{f_s} \left( 2 \sin \left( \pi \frac{f}{f_s} \right) \right)^2 df$ 

 $\approx \int_0^{f_B} \frac{\Delta^2}{12} \frac{2}{f_s} \left( 2\pi \frac{f}{f_s} \right)^2 df$ 

 $\approx \frac{\Delta^2}{12} \frac{\pi^2}{3} \left( \frac{2f_B}{f_s} \right)^3$ 

 $\Lambda^2 \pi^2$  1