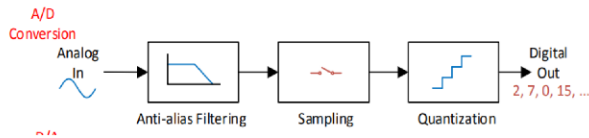


How does an ADC work?



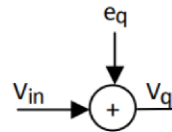
What is the filter for? Can we put it after the quantizer

Questions about the frequency spectrum and harmonics and stuff. Need to know where they appear.

What happens in the discrete time if you have 1GHz f_s and 900 MHz signal frequency? -> we see signal at 100 MHz

What is quantization noise? Formula too

Draw mathematical schematic!



How does the frequency spectrum of quantization noise look? (like white noise)

What happens if you increase f_s ? (total integrated noise is the same but the psd is lower cause you "stretch" the noise over a bigger bandwidth)

Draw a simple S/H! What problems occur? (charge injection, unlinear behaviour of R_{on}) I got bonus points for explaining how charge injection works (with the structure of a semiconductor and that it chooses path of lowest impedance)

How can we reduce/fix these problems? bootlag, bottom plate sampling

Needed to draw the graph (simple low pass)

Explain kT/C noise in connection to the graph. Why is it independent from R ? What happens if we increase R ? -> same integrated noise but lower Bandwidth

What are Specs of ADCs? -> ENOB, SNDR, SFDR (I had to explain what those are, especially SFDR)

Next I had to answer questions about the Flash ADC (You get asked about one of the ADCs you didn't have in your project, but only between Flash, SAR and pipeline)

Draw a 2-Bit flash ADC!

How does it work?

What are bubbles and how could you fix them? ->

Wallace tree encoder (only counts 1s)

What do you have to consider when designing a Flash?

Can you make comparators as small as you want? (to make them as fast as possible) -> NO, you have to consider $\sigma = A_{vt} / \sqrt{W \cdot L}$ (I had to write that formula)

Another question about S/H: What ENOB do you get for 10-bit ADC? ~10.5