

Interview Questions Asked (Client: MOSCHIP)

1. Personal & Background

1. Introduce yourself.
 2. What projects have you worked on?
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2. Analysis Techniques (Analog / AMS Verification)

3. What different analyses have you performed?
 - o DC analysis
 - o AC analysis
 - o Transient analysis
 - o Monte Carlo analysis
 4. What did you do specifically in **AC analysis** for:
 - o Bandgap Reference (BGR)
 - o LDO
 - o Two-stage Op-Amp
 5. Why do we perform **transient analysis**?
 - o What transient tests did you perform for **BGR** and **LDO**?
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3. Monte Carlo & Corner Analysis

6. Have you performed **Monte Carlo analysis**?
 - o During Monte Carlo analysis, what happens to **process corners**?
 - o Do process corners change during Monte Carlo?
 - o If they do not change, then what values are used?
 - o Are you confident about the steps you are explaining?
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4. Parameter Extraction & Automation

7. Do you know how to extract parameters from the schematic level?
 - o How exactly do you extract these parameters?
 - o Can this extraction be automated using Python?
 - o Do you know Python?
 8. Can you write a Python script to extract parameters from a schematic?
 - o Rate your Python skills out of 10.
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5. AMS / Verilog-A Knowledge

9. What do you know about **AMS (Analog Mixed Signal)**?

- Do you know Verilog-A?
- Can you write Verilog-A code for an **8-bit ADC**?

[Interview Questions Asked in 7 Rays Semiconductor](#)

1. Semi-Custom vs Full-Custom Design

1. **Explain the difference between Semi-Custom and Full-Custom design.**
Assume I am a non-technical person. How will you explain Semi-Custom and Full-Custom in simple terms?
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2. Ring Oscillator (RO) – Fundamental Questions

2. **Do you know about Ring Oscillators?**
(Note: They asked even though Ring Oscillator was not mentioned in the resume.)

3. Design Challenge:

You are given the following specifications:

- (A) Design a Ring Oscillator that generates **50 MHz**.
- (B) Ensure the output remains **50 MHz \pm 20% across PVT** (Process–Voltage–Temperature).
- (C) Power consumption must be **very low**, in the **micro-Watt** range.

Question: How will you approach and solve this design problem?

(Discussion lasted ~30 minutes.)

4. What is propagation delay?

5. If the propagation delay of each inverter is $t_p=9$ ns , what is the value of N (number of inverter stages) to achieve 50 MHz?

6. Why can't we choose an even number of inverters in a Ring Oscillator?

- Why is **odd N required**?
- Are you sure we *cannot* design a ring oscillator with an even number of inverters?

3. RC + Inverter Circuit Analysis

7. Consider a circuit:

- One **capacitor** in series with an **inverter**
- Input is applied from the **capacitor side**, output taken from the **inverter side**
- Two different inputs are applied:
 - (a) Step input ($0 \rightarrow 1$)
 - (b) Pulse input (50% duty cycle)

Question: Draw/describe the output waveform for each case.

8. What is the function of the above circuit?

- Have you seen a similar circuit used anywhere?

9. In transient state, does a capacitor behave as an open circuit or a short circuit?

10. What is the impedance of the capacitor?

- What is the value of frequency during transient?
- Why is the frequency not zero?

11. For an RC circuit with pulse-wave input, what is the output response?

4. Filters & Op-Amp Questions

12. Can we design filters using Op-Amps?

- What type of filters are these called?
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5. LDO (Low Dropout Regulator) Questions

13. For an LDO generating 3V from a 6V supply, which MOSFET type will you use as the pass device?

14. For a PMOS-based LDO:

- Where do we connect the op-amp feedback?
 - Inverting input or Non-inverting input?
- Why is it connected that way?
- What is the feedback type?
- Explain the reasoning.