**EXPERIMENT-2**

**TUNED AMPLIFIER**

(Single Tuned Amplifier)

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To design and plot the frequency response of a single tuned amplifier.

1. **Aim:**
2. **Specification:** Operating Frequency of the Circuit = 10 kHz.
3. Silicon-NPN-transistor BC107
4. Resistors:18.3kΩ,6.8kΩ,1kΩ
5. Inductors:3mH
6. Capacitors:0.1µF,10µF,100µF
7. CRO
8. Function Generator
9. Bread board
10. **Hardware:**
11. **Theory:**

**About Tuned Amplifier:**

Tuned Amplifiers are high frequency circuits designed to have a very narrow bandwidth and a voltage gain that peaks at a particular frequency. To produce these characteristics the amplifier uses a resonant parallel LC circuit (or tank circuit) as a BJT Collector load, this gives the amplifier a high voltage gain at the resonant frequency of the tank circuit.

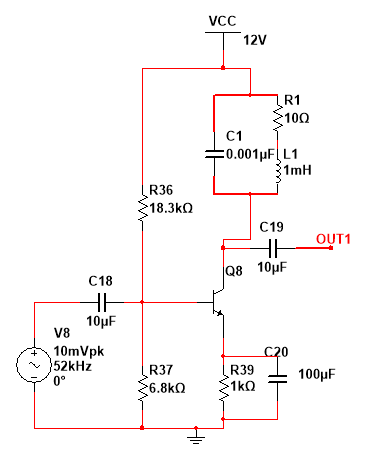
1. **Procedure:**
2. Connect the circuit as per the circuit diagram
3. Apply 10mV pk with 52KHZ frequency using function generator{Software}

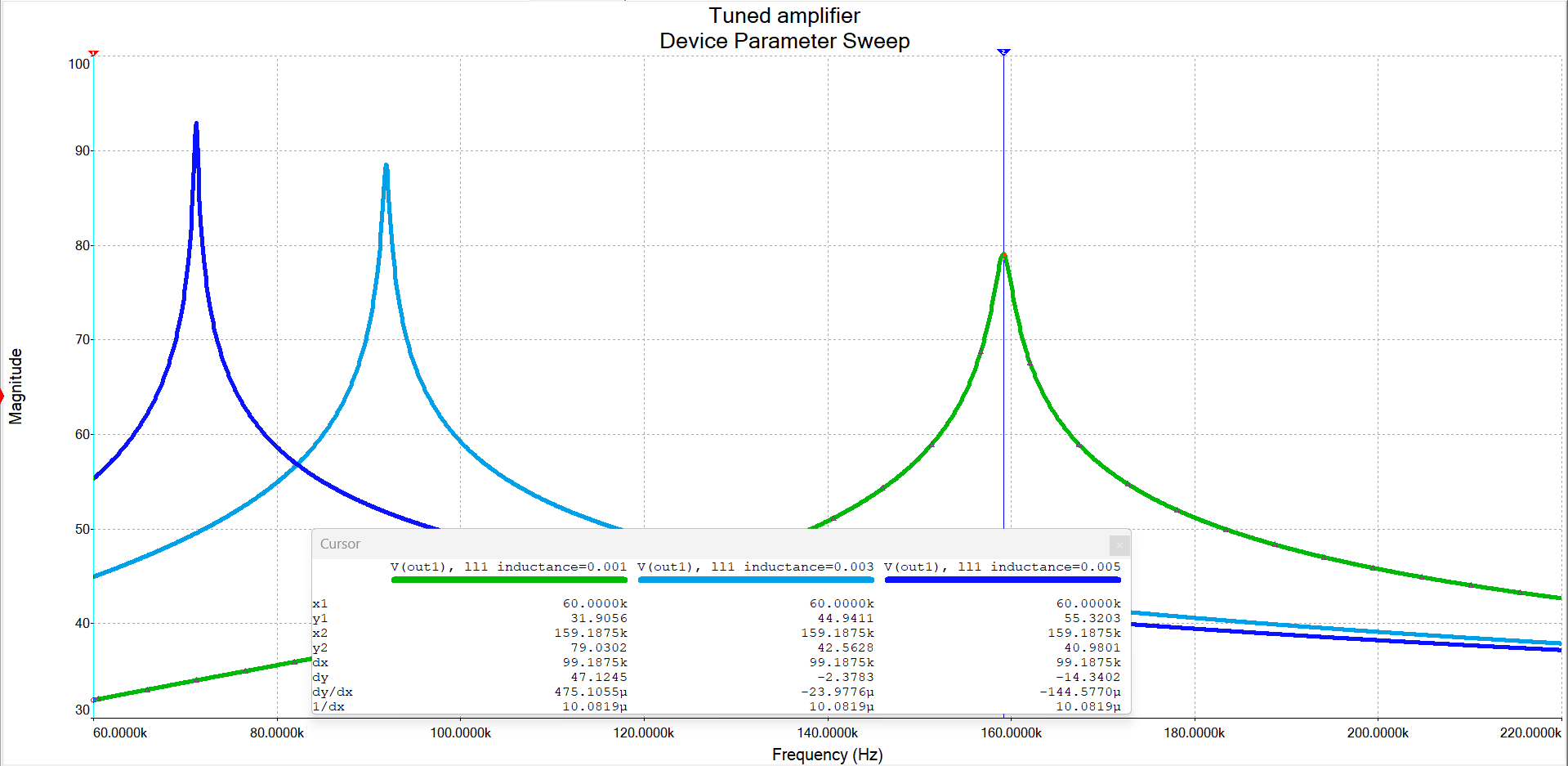
Apply 100mV p-p with 1KHz initially, slowly increase the frequency of Input Signal.

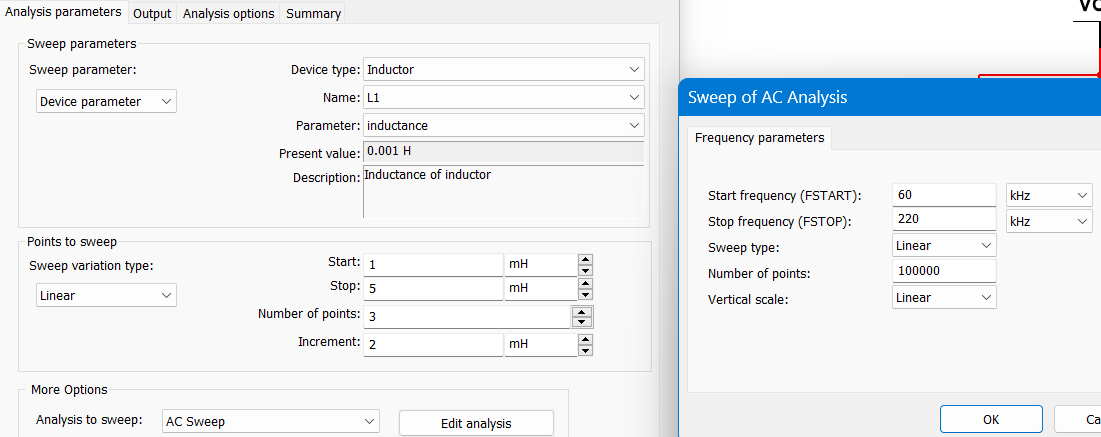
1. Observe the output in CRO.
2. Note output Vp-p and frequency for max Amplitude in Observation Table.
3. Plot Frequency Response from Observations.
4. **Design:**

C=0.1µF, L~=3mH, Fc = 10KHz

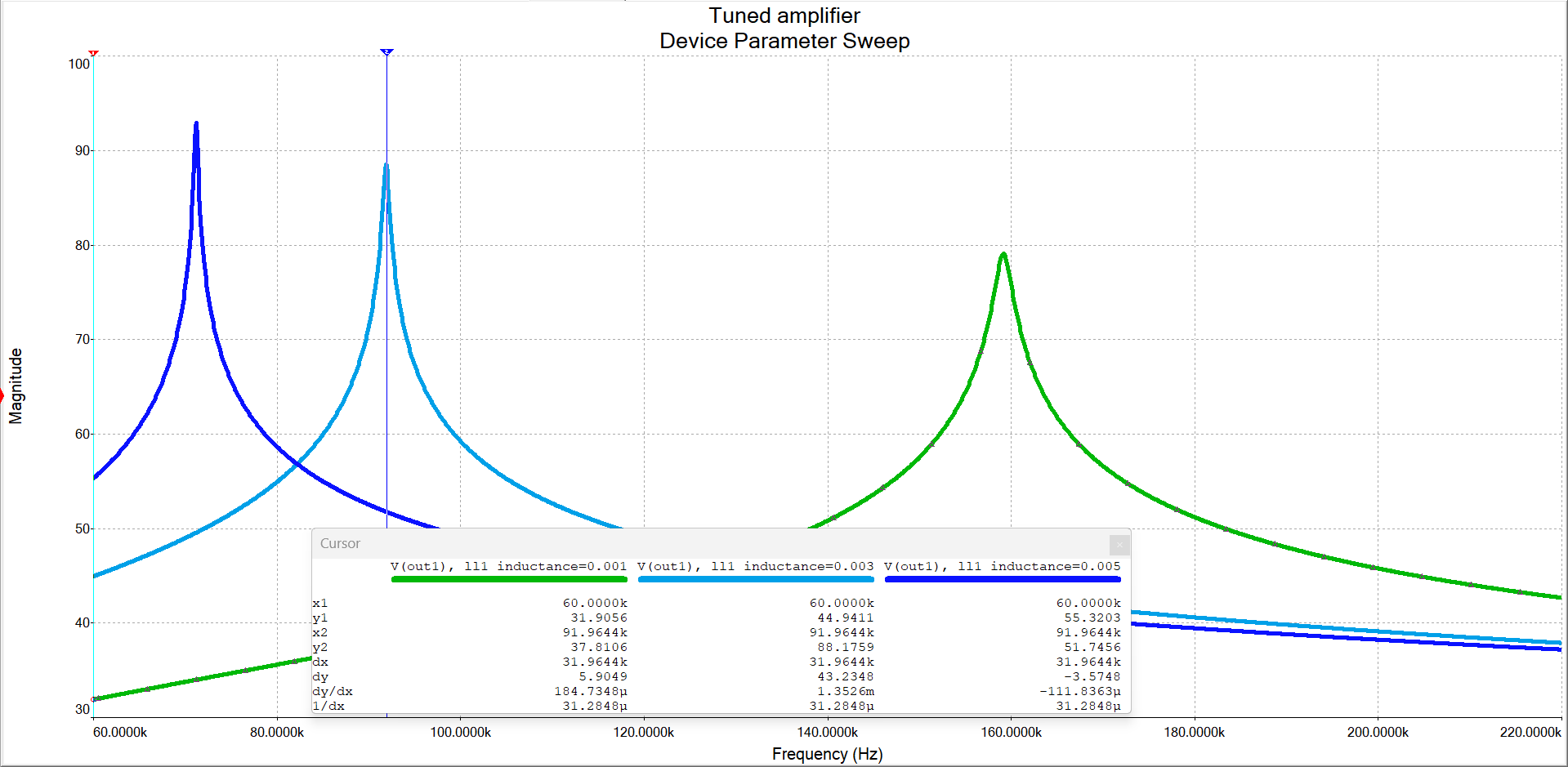
1. **Simulation Observations:**
2. **Single Tuned Amplifier:**

**For L=1mH**

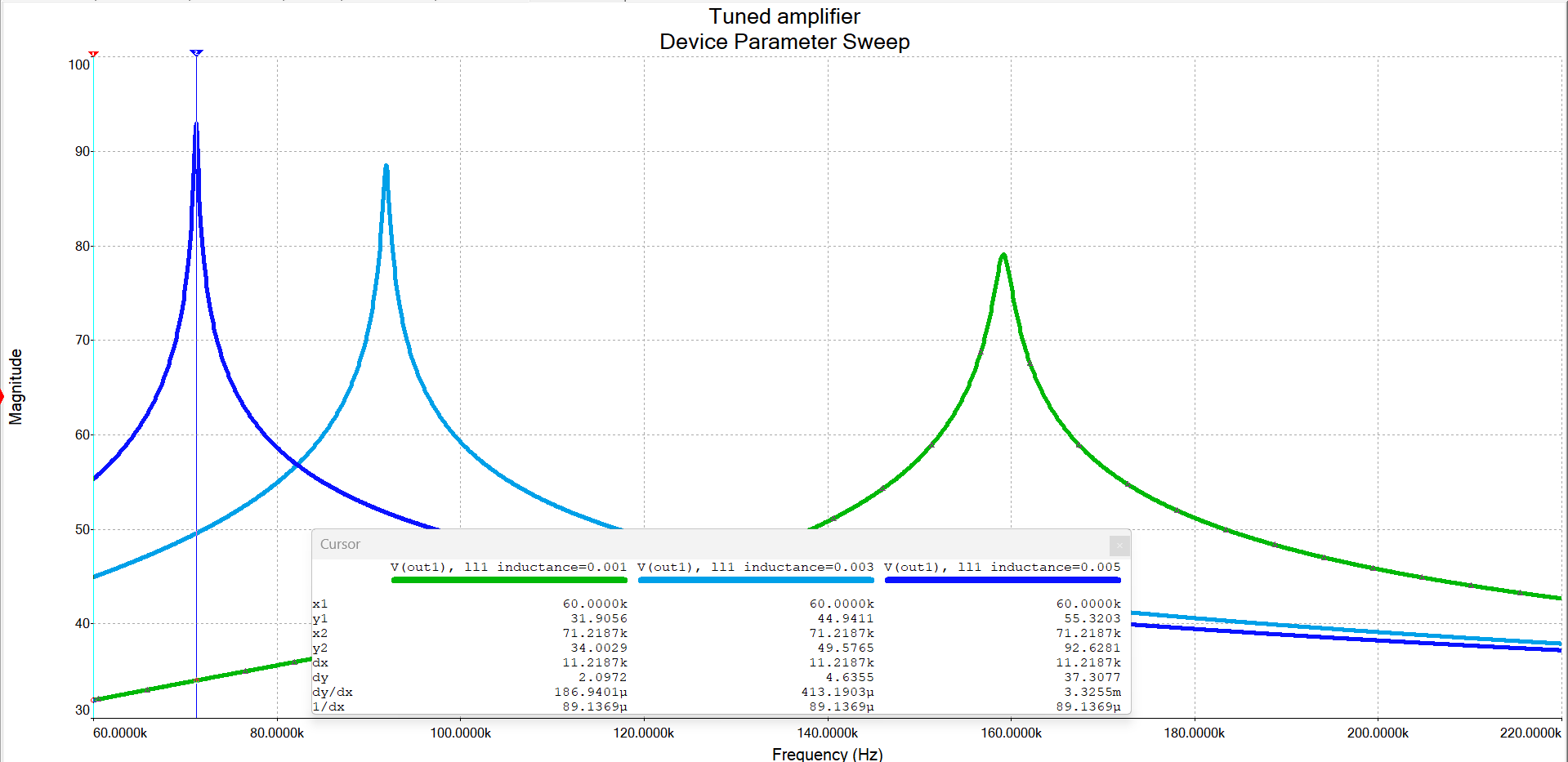




**For L=3mH**

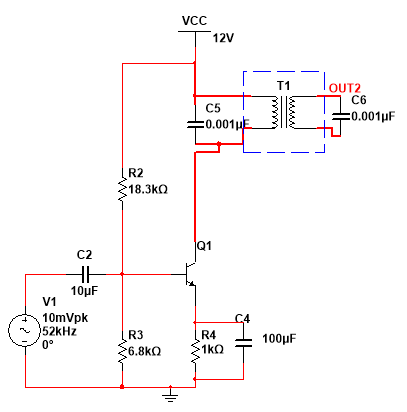
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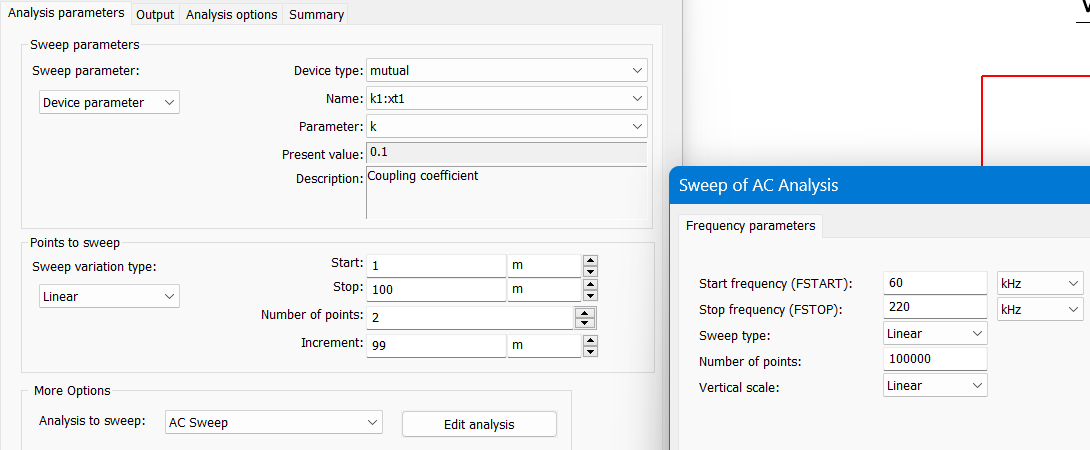
**For L=5mH**



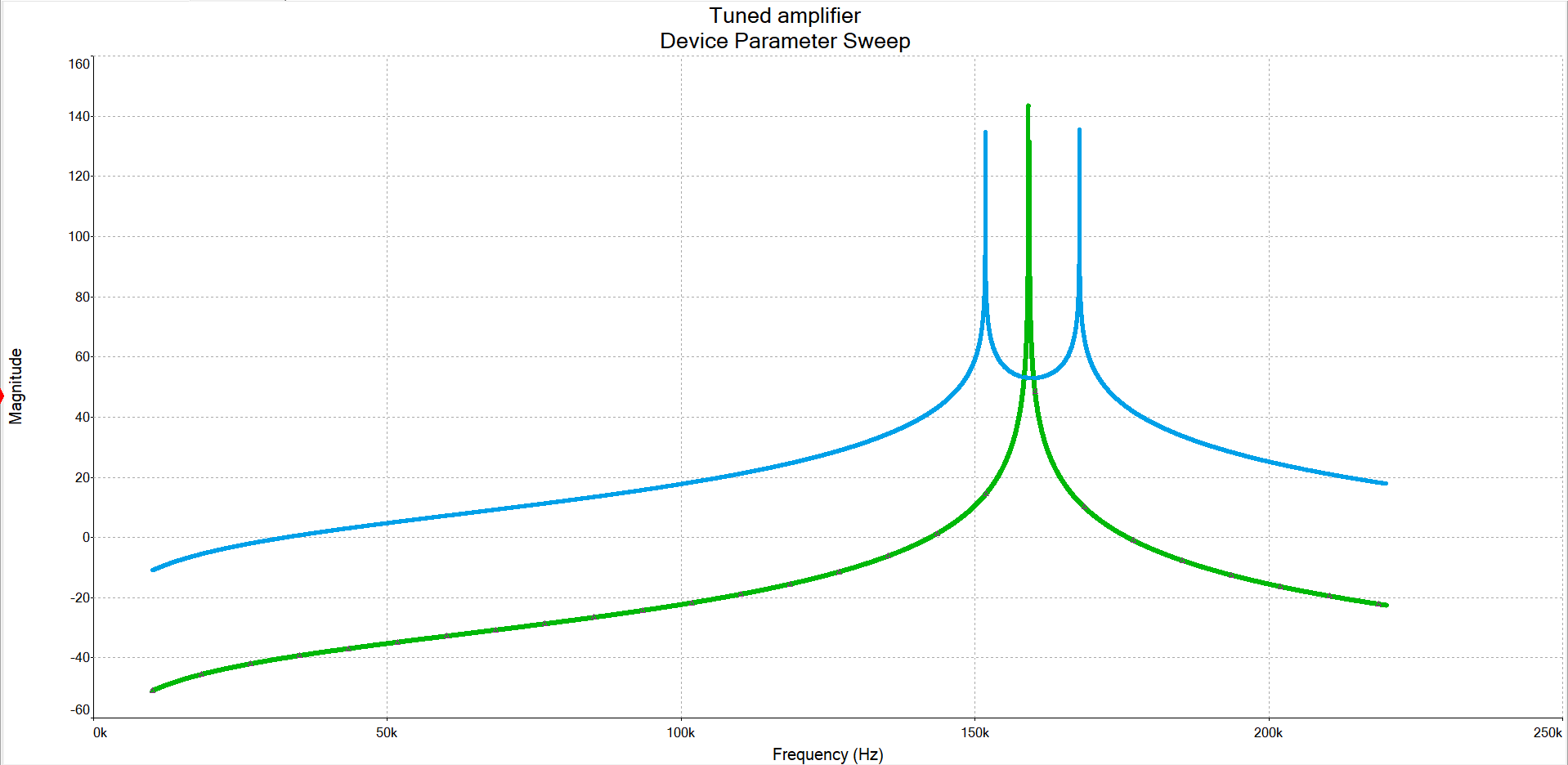
So from the above 3 cases we can observe that as Inductance increases the resonant frequency is decreasing and band becomes narrow which allows to operate our amplifier circuit at a particular frequency ,which provides max pull up resistance at that frequency allowing us to amplify the input signal at that frequency only. This Circuit Provides good selectivity of Frequency.

1. **Double Tuned Amplifier:**

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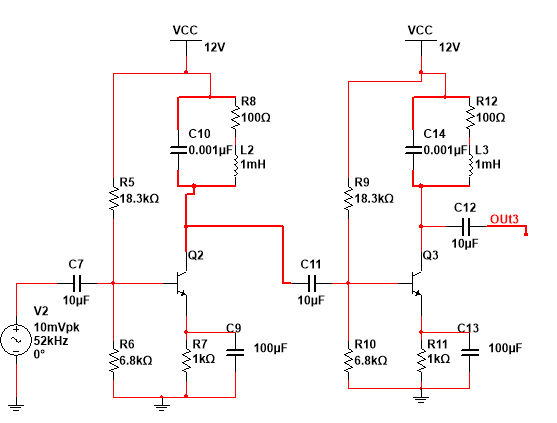


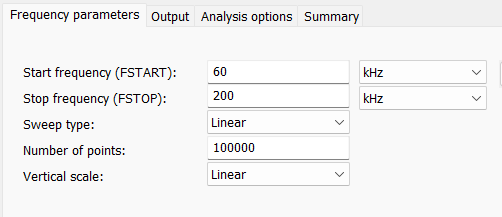
Bandwidth=k\*f Where k=coefficient of coupling

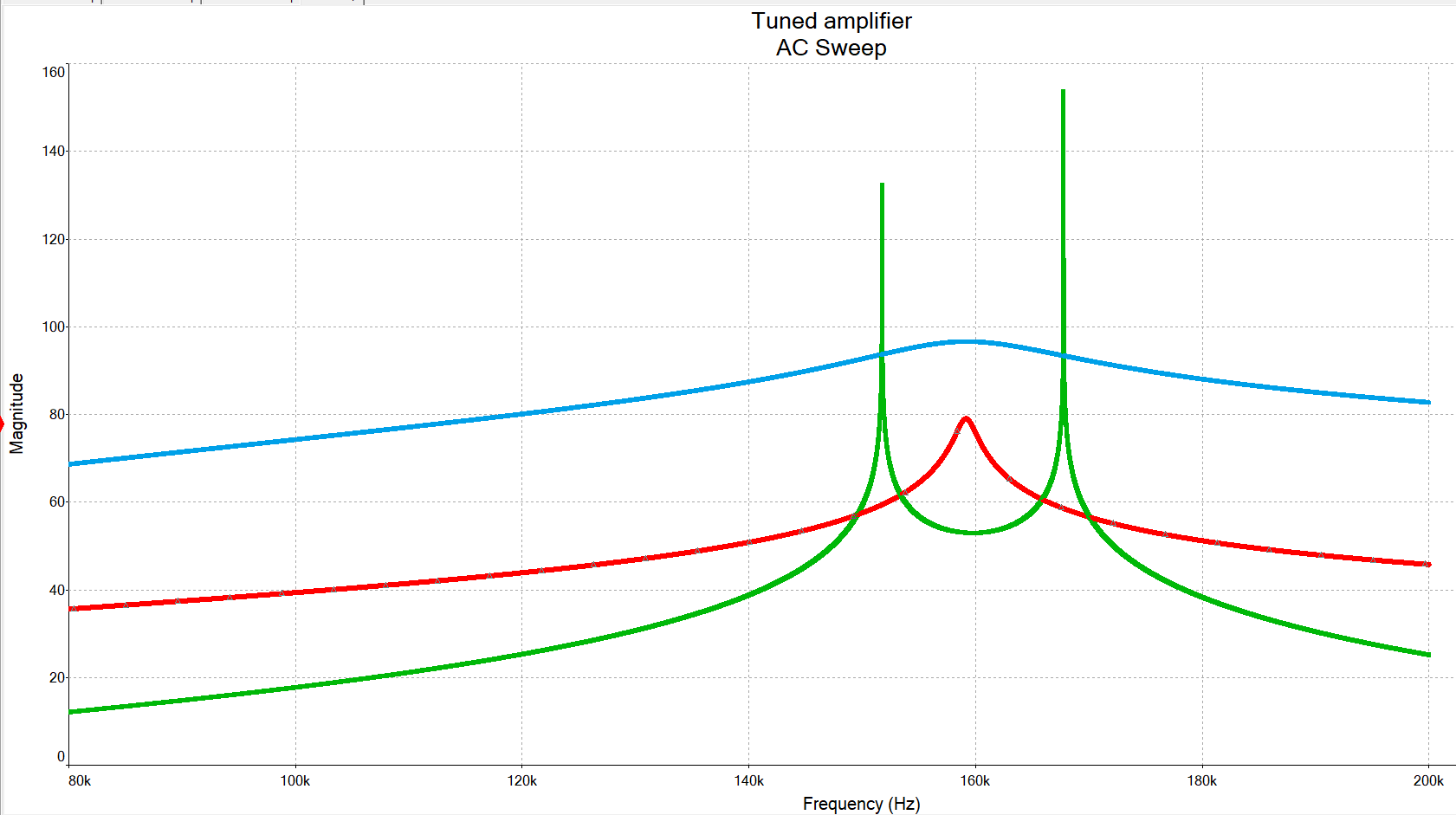
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It offers better selectivity and bandwidth when compared with single tuned amplifiers. As the value of coefficient of coupling increases, bandwidth increases.

1. **Stagger Tuned Amplifier:**

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These staggered tuned amplifiers provide a wider bandwidth when compared with single tuned and staggered tuned amplifiers and hence this amplifier offers better selectivity.

Signature of the Faculty