UNITY GAIN PHASE SPLITTER

Circuit Simulation done by:

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Theory:

This circuit takes an input and provides two outputs equal to the input, but with opposite phases.

The capacitor and the 150k and 56k resistors bias the transistor. The base-emitter junction acts like a diode, so that the emitter will be a diode drop lower than the base.

The emitter voltage fluctuates with the input voltage, and so the current across the emitter resistor fluctuates proportionately. Since the collector resistor has the same current across it, the collector voltage swings the same amount, but with phase opposite to the input, because the larger the current, the larger the voltage drop from +20V.

Circuit Diagram :

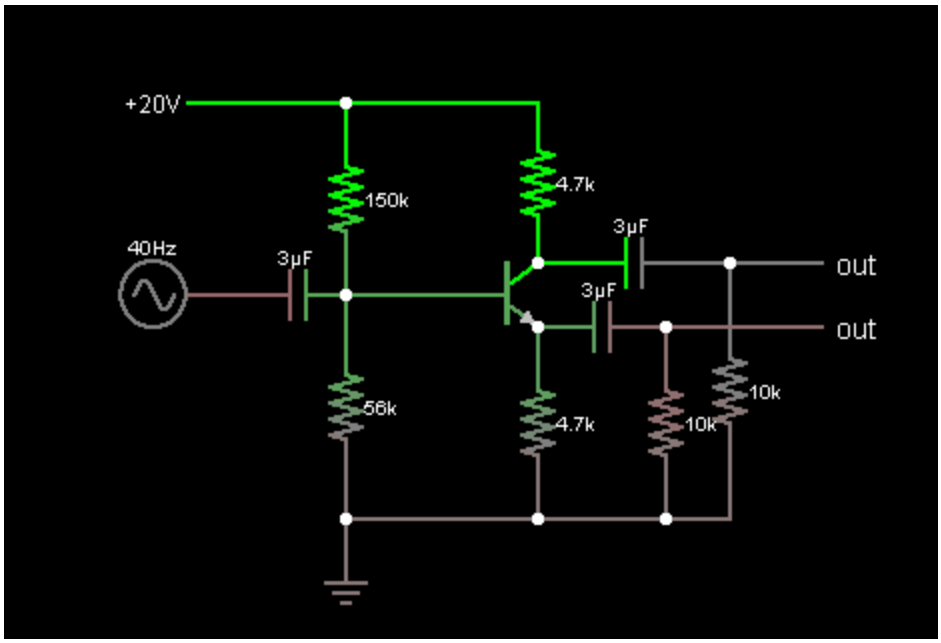

Fig 1: Circuit Diagram

Model Graph :

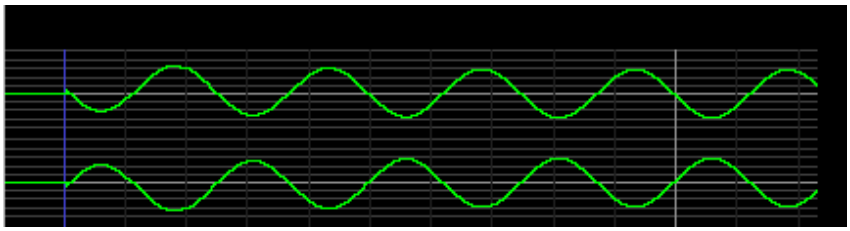

Fig 2: Output waveforms of unity gain phase splitter

Schematic Diagram:

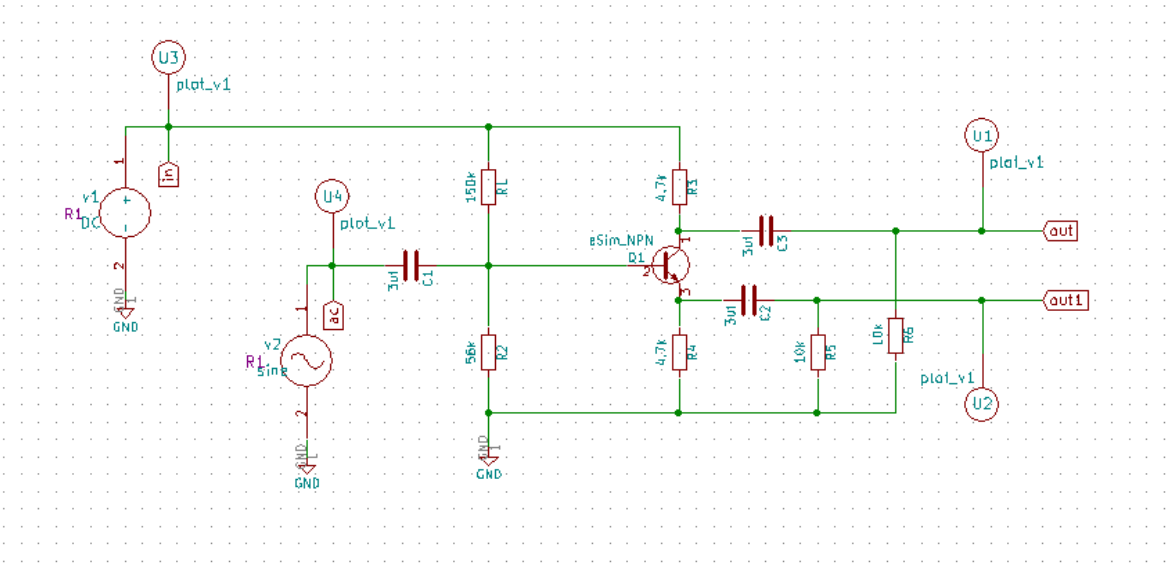

Fig 3: Schematic circuit of unity gain phase splitter.

Simulation Results:

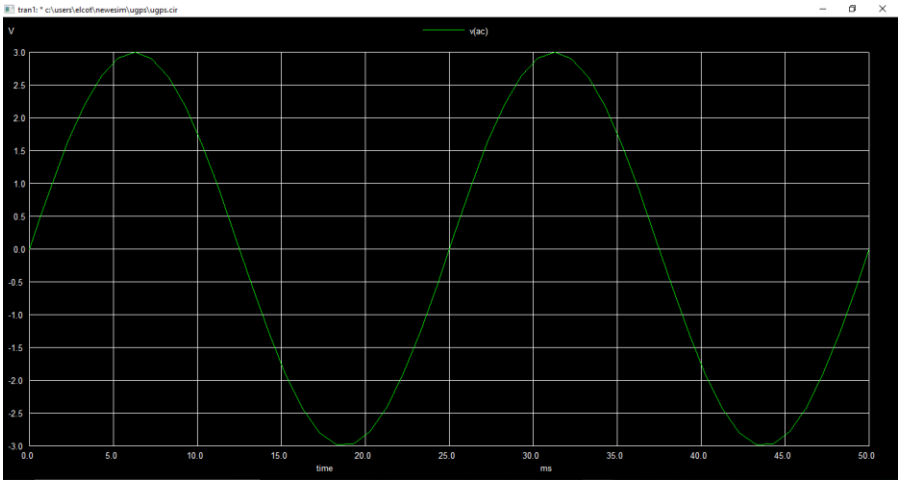

Fig 4: Input Ac waveform

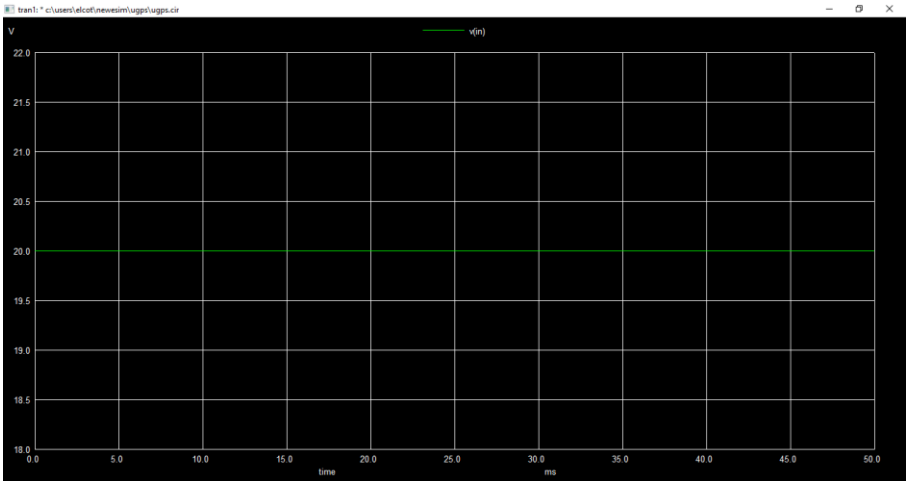

Fig 5: Input DC waveform

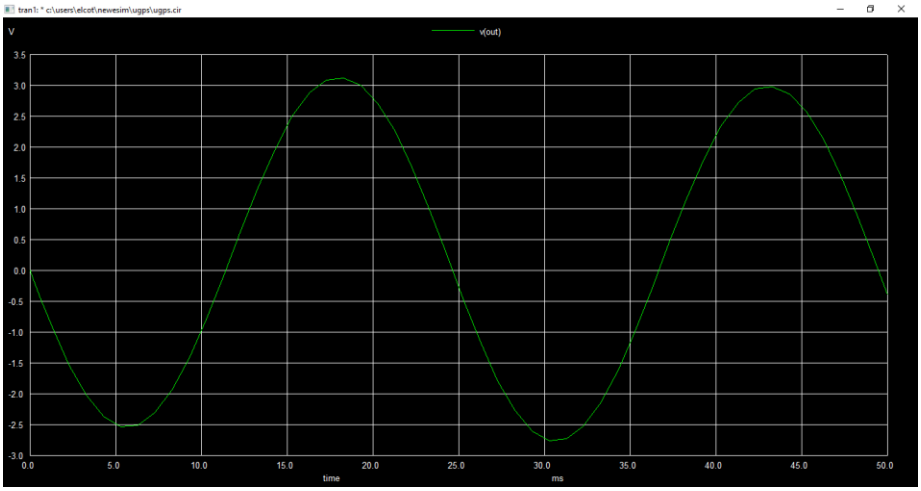

Fig 6: Output (Negative phase)

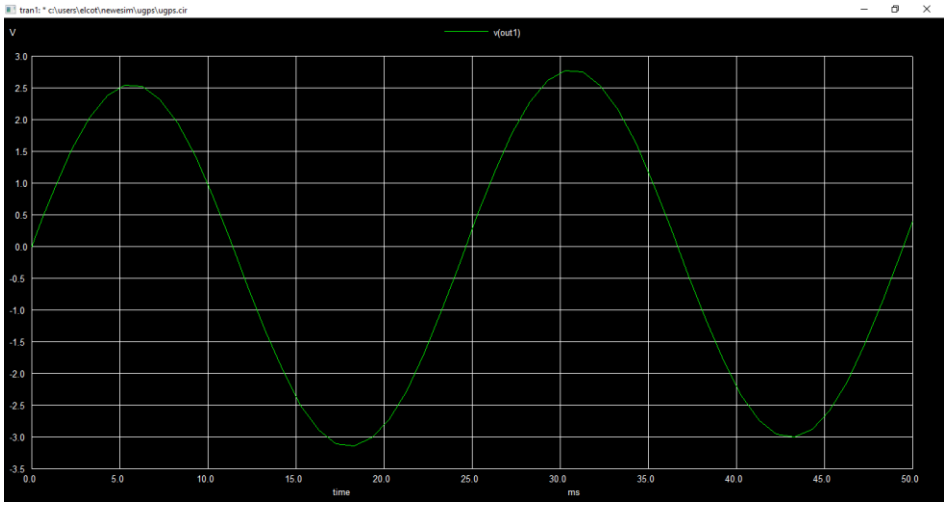

Fig 7: Output (Positive Phase)

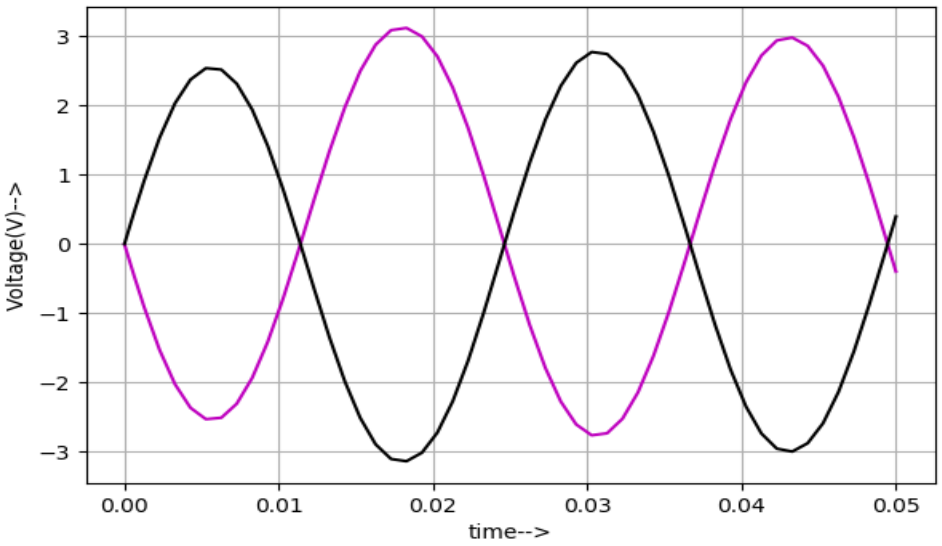

Fig 8: Python Plot of unity gain phase splitter

Reference :

https://www.indiabix.com/electronics-circuits/unity-gain-phase-splitter/