

HARTLEY OSCILLATOR

INTRODUCTION:

It is an electronic oscillator circuit and its frequency is determined by tuned circuits consisting of inductor and capacitor. To generate sinusoidal oscillations and to form resonance tank circuit, the Hartley oscillator design uses two inductive coils in series with a parallel capacitor.

THEORY:

Resistor R1, R2, R3, R4 provide necessary ac bias to the transistor. C1 is the bypass capacitor where C3, C2 are coupling capacitors. The coupling capacitor is used to decouple ac and dc signals. The feedback network consists of L1, L2, C4 which determines the frequency of oscillation. The oscillatory current in the tank circuit produces ac voltage across L1 and L2. The total phase shift of Hartley oscillator is around 360 degree.

DESIGN:

The frequency of oscillation is given by,

$$f = 1 / (2 * \pi * (L_{eq} * C)^{1/2})$$

Given:

$$f = 10 \text{ kHz}$$

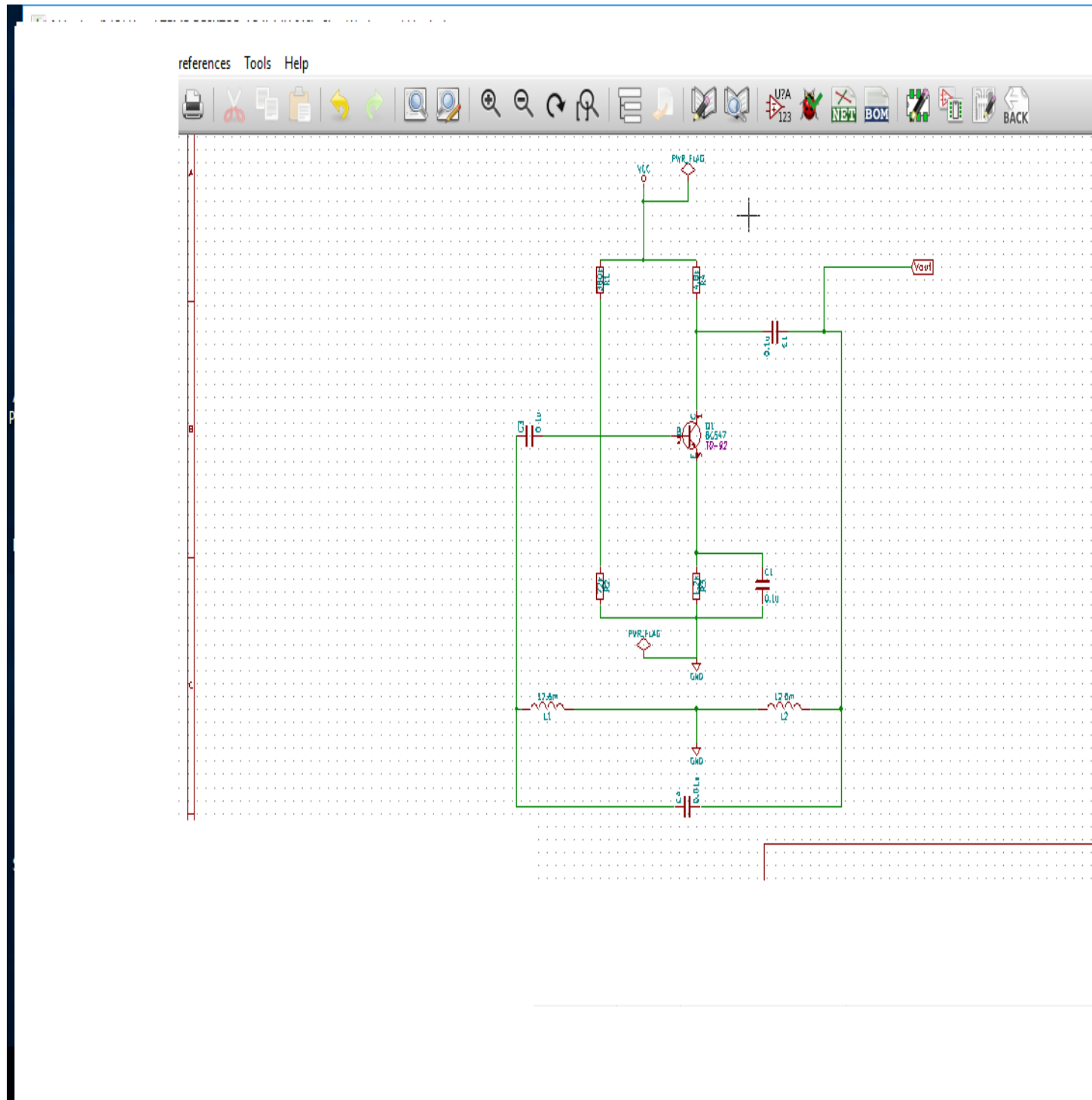
$$C = 0.01 \mu\text{f}$$

Calculated:

$$L_{eq} = 25.3 \text{ mH}$$

$$L1 = L2 = 12.66 \text{ mH}$$

SCHEMATIC DIAGRAM:



SIMULATION RESULT:

