LOOP ANTENNA -> 1 GHz
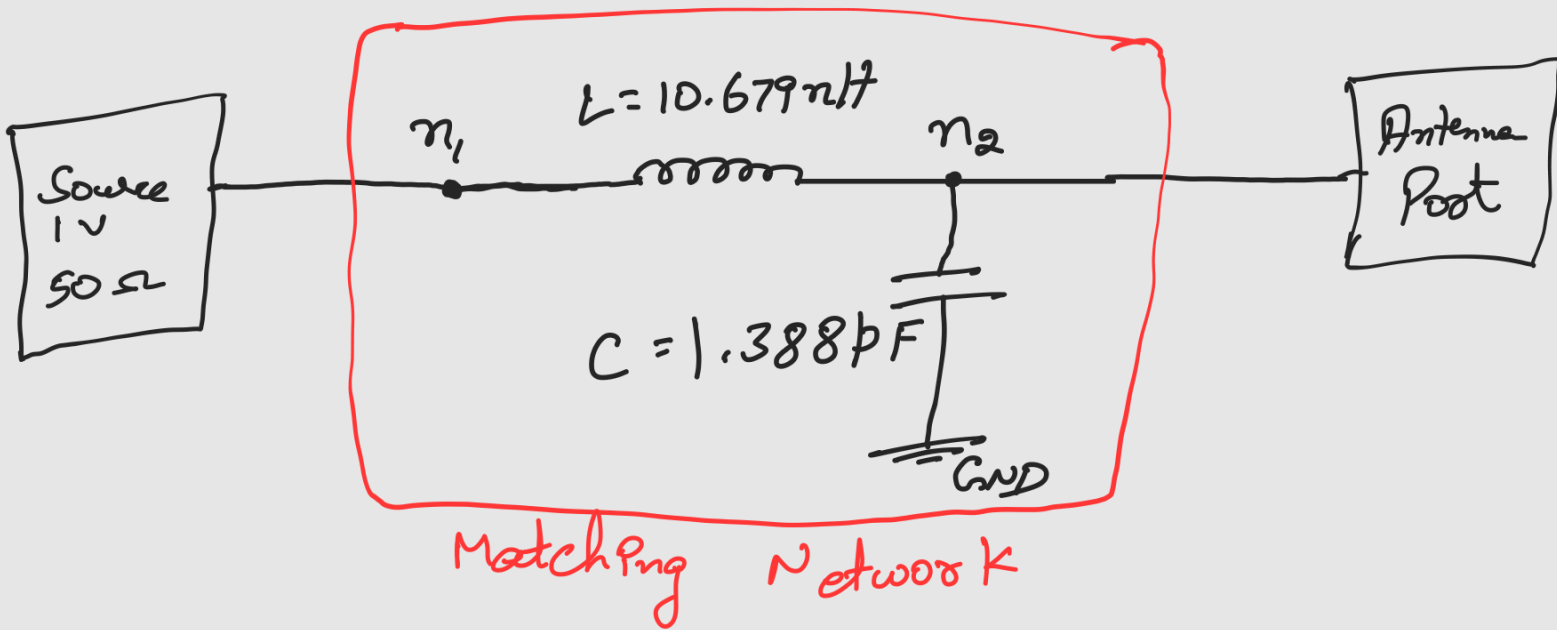
The resonant Frequency is 1 GHz.
For impedance, matching circuit can be added to have impedance match to 50 ohms.

For the above circuit,
$Z\_L = 138 - j16.7$ ohms;
$Zo = 50$ ohms;
$f = 1$ GHz

$y = Zo / Z\_L = 0.357 + 0.043j$

$$\boxed{g = 0.357} \quad \boxed{b = 0.043}$$

$$L = \frac{Zo\sqrt{g^{-1}-1}}{2\pi f} = \underline{10.679 \text{ nH}}$$

$$C = \frac{-b+\sqrt{g-g^2}}{2\pi f \, Zo} = \underline{1.388 pF}$$

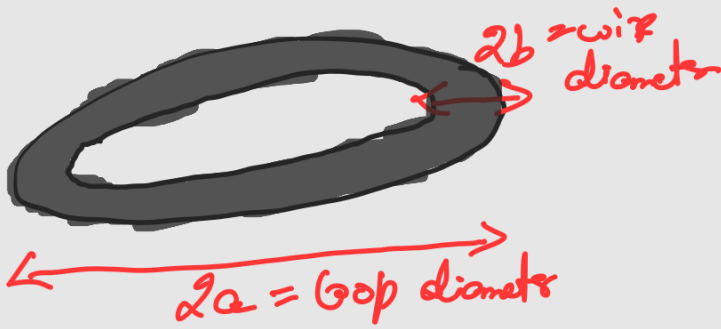Loops resonant at almost $Ka \approx 1$, & $f = 1 GHz$

So, $Ka = 1$

$$\frac{2\pi}{\lambda} a = 1$$

$$a = \frac{\lambda}{2\pi} = \frac{c/f}{2\pi}$$

$$\boxed{a = 0.047 \, m}$$

a (meter)	f_r (GHz)
0.047	1.10
0.05	1.01
0.0506	0.998
0.0505	1.0007

$$\frac{loop\ length/Circumfrence}{} \propto \frac{1}{f_r}$$

$2b = $ wire diameter

$2a = $ loop diameter