For the microstrip design in above diagram:

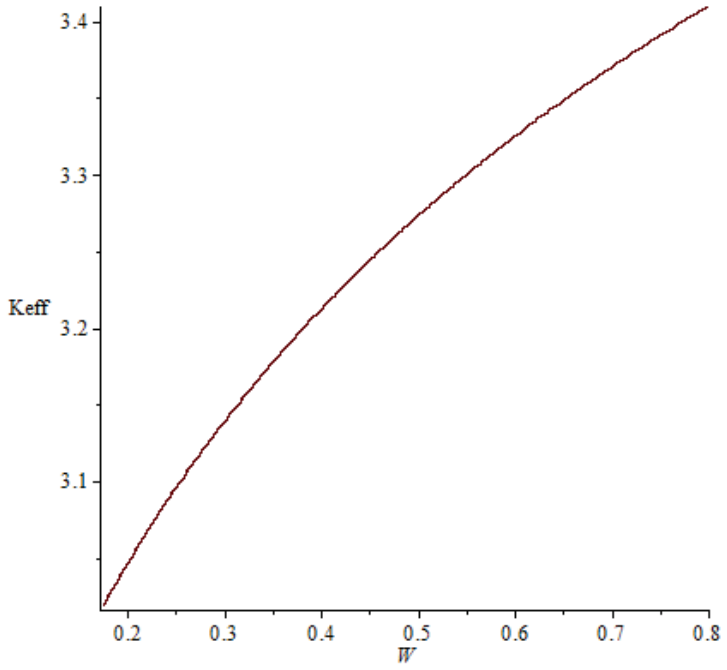
$$\left(\frac{W}{H}\right) = \frac{0.37}{0.175} \approx 2.114285714 \geq 1$$

therefore,

$$K_{eff} = \frac{K_r+1}{2} + \frac{K_r-1}{2} * \frac{1}{\sqrt{1+12\left(\frac{H}{W}\right)}} = \frac{4.16+1}{2} + \frac{4.16-1}{2} * \frac{1}{\sqrt{1+12\left(\frac{0.175}{0.37}\right)}} = 3.19$$

A RF design may use microstrips with different W in a real word design. The effective dielectric constant is plotted in the following chart when W is selected between 0.176mm and 0.8mm.

$$plot\left(\frac{4.16+1}{2} + \frac{4.16-1}{2} \cdot \left(\frac{1}{\sqrt{1+12\left(\frac{0.175}{W}\right)}}\right), W = 0.176..0.8\right)$$



Finally, the K_{eff} is within [3.01, 3.40] and the average is 3.21. In most cases, the acceptable design can be implemented by using the average as K_{eff}.

When $\left(\frac{W}{H}\right) < 1$: