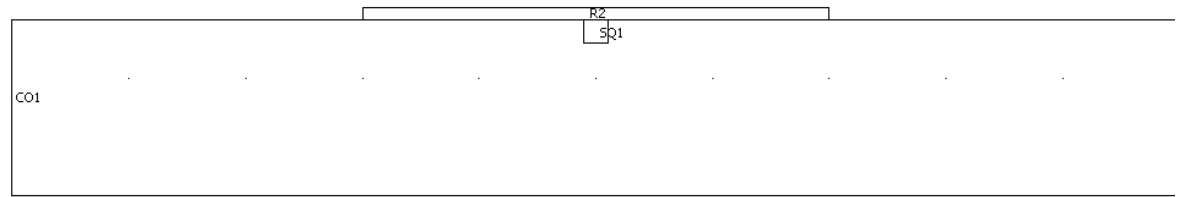


Geometry Representation (Figure 1)

- R2 represents the Thermoelectric Module ($k=6\text{W/mK}$)
- SQ1 represents the current space filled with a thermal paste ($k=2.8\text{ W/mK}$)
- CO1 represents the upper portion of the aluminum test unit ($k=160\text{W/mK}$)

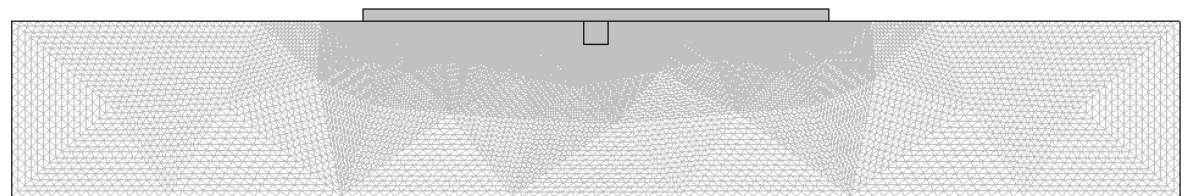
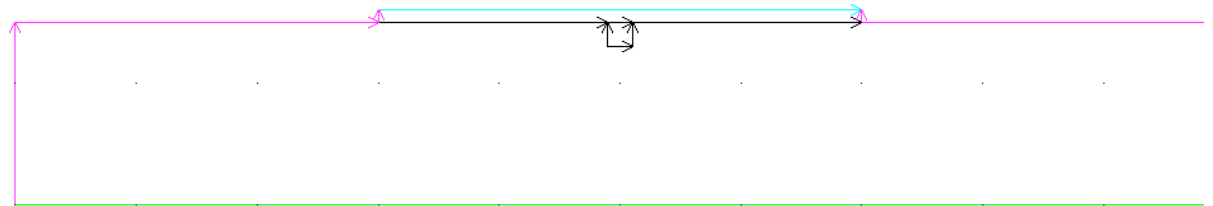


Boundary Conditions (Figure 2)

- Blue has a temperature of 30°C or 303K
- Green has a temperature of 200°C or 473K
- Pink represents insulated boundaries
- Black represents internal boundaries

Mesh (Figure 3)

- There are 67584 elements



FEA Solution (Figure 4)

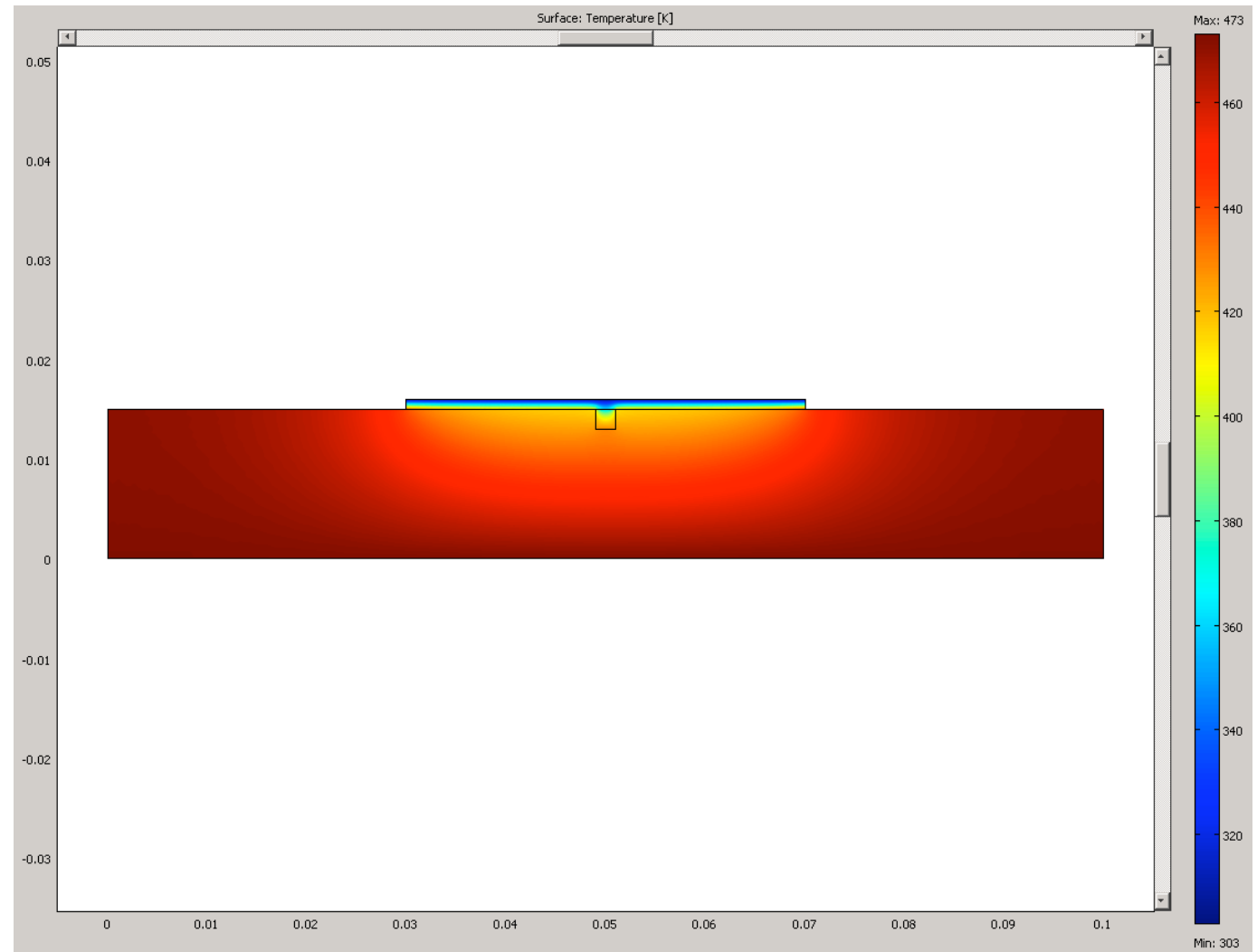
\bar{T} = average temperature

$$\bar{T} = \frac{\int_0^L \int_0^w T(x, y) dx dy}{A}$$

$$\bar{T}_{R2} = 361.2K$$

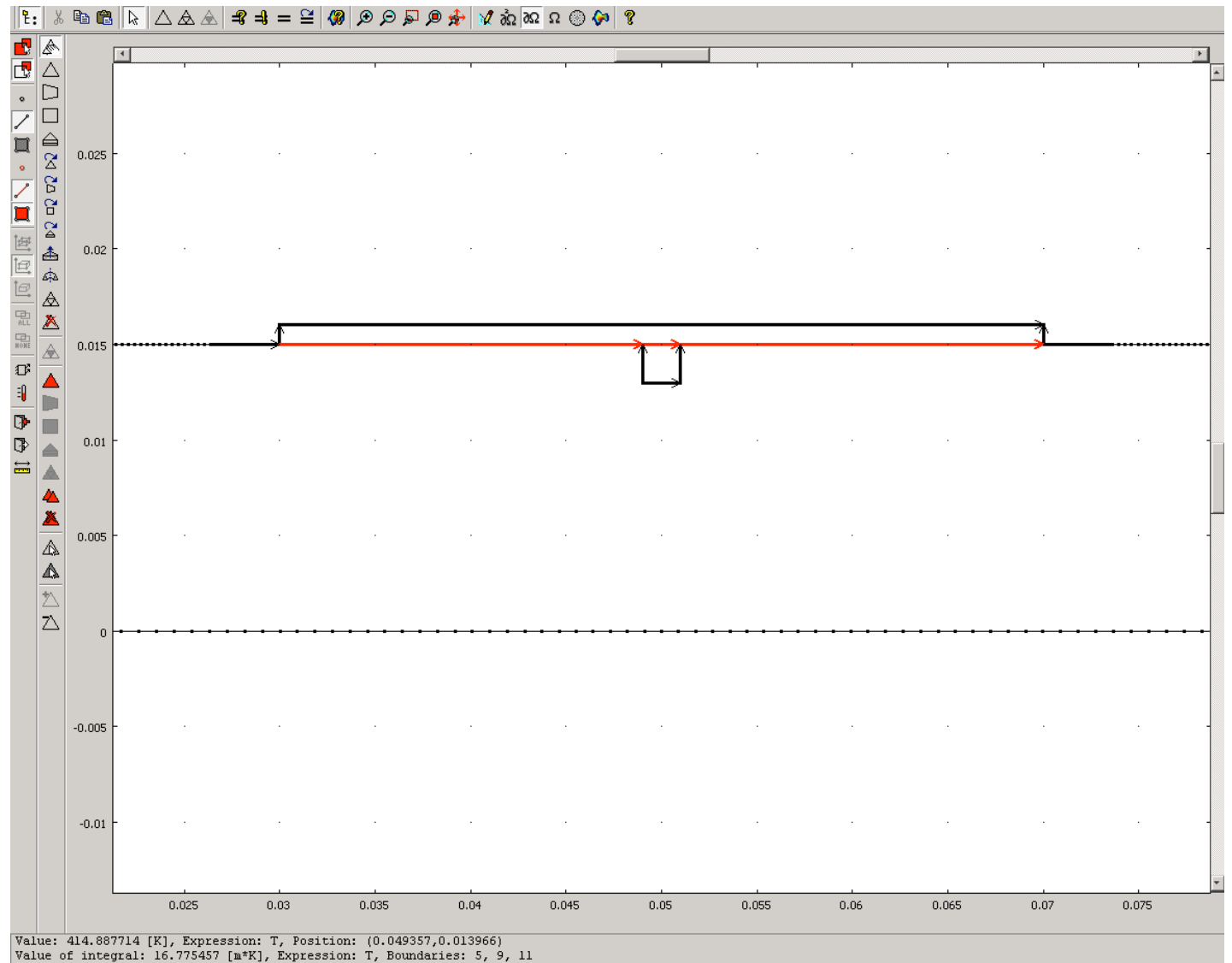
$$\bar{T}_{SQ1} = 409.5K$$

$$\bar{T}_{CO1} = 460.2K$$

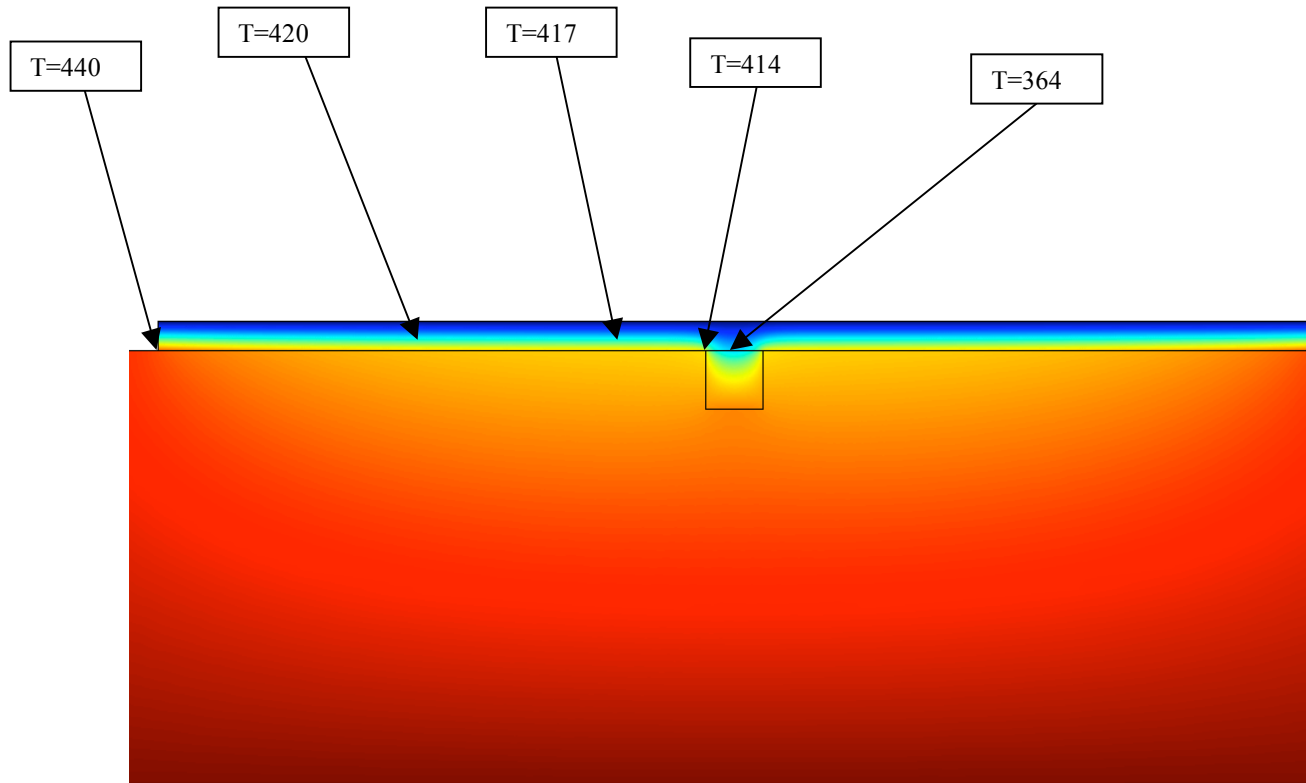


Boundary Integral (Figure 5)

$$\bar{T} = \frac{\int_0^L T(x) dx}{L}$$
$$\bar{T} = \frac{16.775457 m \cdot K}{0.04 m}$$
$$\bar{T} = 419.4 K$$



Solution – Closer Look (Figure 6)



Possible Change (Figure 7)

-Boundary integral yields

$$\bar{T} = 420.7K$$

-Specific points range from 414K in the center to 441K on the bottom corner of the TEM

