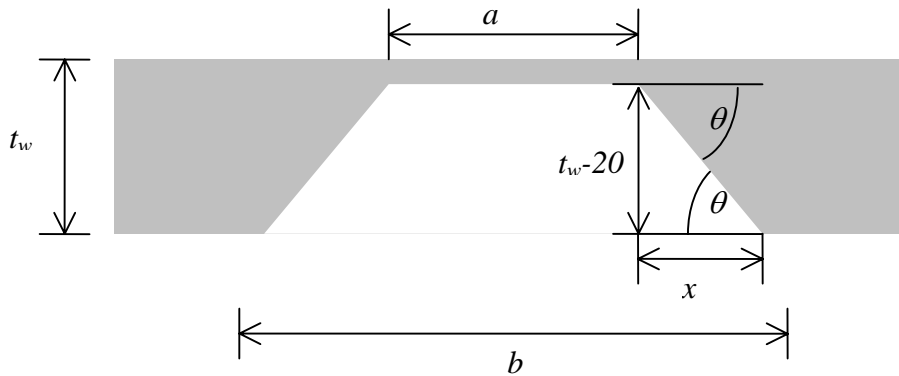


Solution to homework #4

Problem 1



From the geometry of KOH etching of (100) silicon wafer, we see that $b = a + 2x = a + 2(t_w - 20) \cot \theta$. Since $\theta = 54.7^\circ$, we get the following.

t_w (microns)	490	500	510
b (microns)	1065.6	1079.7	1093.9

To see the influence of t_w on the side of the square diaphragm, we use $a = b - 2x = b - 2(t_w - 20) \cot \theta$. This gives:

t_w (microns)	490	500	510
a (microns)	414.2	400	385.8

If we assume that the sensitive is inverse fourth power of a , we can compute the percentage sensitivity as follows.

t_w (microns)	490	500	510
$\% \text{ sensitivity} = \frac{a_1^4 - a_2^4}{a_2^4}$	-12.99	0	+15.5

Notice how large the error is going to be due to small variations in wafer-thickness.

Problem 2

Power Point file has the solution.