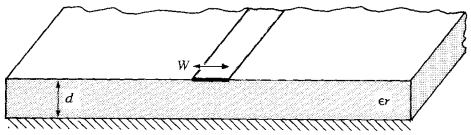
Microstrip Line Impedances



$$\varepsilon_e = \frac{\varepsilon_r + 1}{2} + \frac{\varepsilon_r - 1}{2} \cdot \frac{1}{\sqrt{1 + 12d / W}}$$

$$Z_0 = \begin{cases} \dfrac{60}{\sqrt{\varepsilon_e}} \cdot \ln\left(\dfrac{8d}{W} + \dfrac{W}{4d}\right) & \text{for } \dfrac{W}{d} \le 1 \\ \dfrac{120\pi}{\sqrt{\varepsilon_e} \cdot \left(\dfrac{W}{d} + 1.393 + 0.667 \cdot \ln\left(\dfrac{W}{d} + 1.444\right)\right)} & \text{for } \dfrac{W}{d} \ge 1 \end{cases}$$

For further details on those formulas please refer to:
I.J. Bahl and D.K. Trivedi, "A Designer's Guide to Microstrip Line", Microwaves, May 1977, pp. 174-182

Dielectric Constant	Width/Height (W/d)	Effective Dielectric Constant	Characteristic Impedance
4.8	0.5	3.28	92.1
4.8	0.8	3.38	75.8
4.8	1	3.43	68.1
4.8	1.2	3.47	62.4
4.8	1.3	3.49	59.9
4.8	1.4	3.51	57.6
4.8	1.5	3.53	55.5
4.8	1.6	3.55	53.6
4.8	1.7	3.57	51.7
4.8	1.8	3.59	50.0
4.8	1.9	3.60	48.5
4.8	2	3.62	47.0
4.8	2.2	3.65	44.3
4.8	2.5	3.69	40.8
4.8	3	3.75	36.1
4.8	4	3.85	29.5
4	0.5	2.80	99.7
4	0.8	2.88	82.2
4	1	2.92	73.9
4	1.2	2.95	67.7
4	1.3	2.97	65.0
4	1.4	2.98	62.5
4	1.5	3.00	60.2
4	1.6	3.01	58.1
4	1.7	3.03	56.2
4	1.8	3.04	54.3
4	1.9	3.05	52.6
4	2	3.07	51.0
4	2.2	3.09	48.1
4	2.5	3.12	44.4
4	3	3.17	39.3
4	4	3.25	32.1
2.55	0.5	1.93	120.1
2.55	0.8	1.97	99.3
2.55	1	1.99	89.4
2.55	1.2	2.01	82.1
2.55	1.3	2.02	78.8
2.55	1.4	2.03	75.9
2.55	1.5	2.03	73.2
2.55	1.6	2.04	70.6
2.55	1.7	2.05	68.3
2.55	1.8	2.05	66.1
2.55	1.9	2.06	64.1
2.55	2	2.07	62.2
2.55	2.2	2.08	58.7
2.55	2.5	2.10	54.1
2.55	3	2.12	48.0
2.55	4	2.16	39.3