

Capacitance of Two Parallel Plates on a PCB

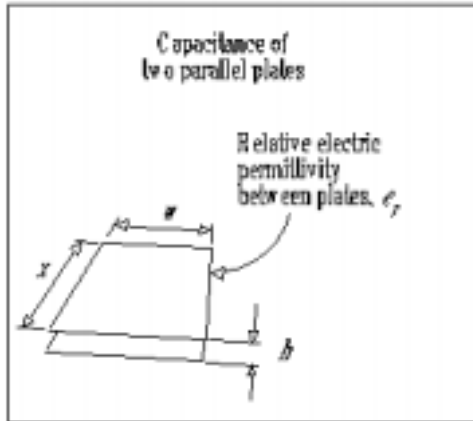
file: capac.mcd

Most of this script is found in: Howard Johnson and Martin Graham's, "High Speed Digital Design", Prentice-Hall, New Jersey, 1993

Formulas included in this spreadsheet:

Capacitance of two plates

CPLATE()



Variables names used:

- W Width of plate overlap (inch)
- X Length of plate overlap (inch)
- H Height of one plate above the other (inch)
- ER Relative Dielectric of the PCB
- FS Electric Permittivity of Free Space (Constant, inch)

Variables values used:

- Width of plate overlap W := 10.5
- Length of plate overlap X := 12
- Height of one plate above the other H := .063
- Relative Dielectric of the PCB ER := 4.5
- Electric Permittivity of Free Space FS := 2.24910⁻¹³

Capacitance between the two plates (F):

$$CPLATE(fs, er, w, x, h) := fs \cdot \frac{er \cdot x \cdot w}{h}$$

$$CPLATE(FS, ER, W, X, H) = 2.024 \cdot 10^{-9}$$

Laminate Properties (GE)

Thickness	er	Tol (+/-)	Thickness	er	Tol (+/-)
0.0027	3.8	.0005	0.018	4.1	.0015
0.004	3.9	.0005	0.021	4.2	.002
0.005	3.8	.0007	0.024	4.1	.002
0.006	3.9	.0007	0.028	4.2	.002
0.007	3.8	.001	0.028-Alt	3.8	.002
0.008	3.9	.001	0.031	4.1	.003
0.01	3.9	.001	0.031-*	4.2	.004
0.012	3.9	.001	0.044-*	4.2	.005
0.014	4.2	.0015	0.059-*	4.2	.005