Constants

$\mu 0 := 4\cdot\pi\cdot 10^{-7}\cdot\frac{H}{m}$ permeability of vacuum

$c := 3\cdot 10^{8}\cdot\frac{m}{s}$ speed of light in vacuum

$\varepsilon 0 := \frac{1}{\mu 0\cdot c^{2}}$ permittivity of vacuum $\varepsilon 0 = 8.842\,\frac{pF}{m}$

Definition of PDN square

$W := 10\cdot\mu m$	width	$l := 10\cdot\mu m$	$\rho := 1.678\cdot 10^{-8}\cdot\Omega\cdot m$	resistivity
$d := 100\cdot\mu m$	distance from ground		$\varepsilon_r := 4.4$	relative permittivity of dielectric
$t := 20\cdot\mu m$	thickness		$df := 0.02$	loss tangent of dielectric

Calculated Values

$C := \varepsilon 0\cdot\varepsilon_r\cdot\frac{W\cdot l}{d}$ capacitance $C = 38.904542\,aF$

$v := \frac{c}{\sqrt{\varepsilon_r}}$ $v = 1.43\times 10^{8}\,\frac{m}{s}$ propagation velocity $Td := \frac{l}{v}$ time delay $Td = 69.921\,fs$ $Td = \sqrt{L\cdot C}$ relationship between delay and L and C

$L := \frac{Td^{2}}{C}$ inductance $L = 125.664\,pH$ $\frac{L}{2} = 62.832\,pH$ half inductance per leg $\sqrt{\frac{L}{C}} = 1.797\,k\Omega$ impedance

$R := \frac{\rho}{W\cdot t}\cdot l$ resistance $R = 839\,\mu\Omega$ $\frac{R}{2} = 419.5\,\mu\Omega$ half resistance per leg