NPTEL Video Course - Electrical Engineering - NOC:VLSI Interconnects

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Co-ordinating Institute - IIT - Kharagpur

Sub-Titles - Available / Unavailable | MP3 Audio Lectures - Available / Unavailable

Lecture 1 - Introduction to VLSI interconnects
Lecture 2 - The distributed RC interconnect model
Lecture 3 - The Elmore delay
Lecture 4 - Elmore delay in interconnects
Lecture 5 - Elmore delay in branched RC interconnects
Lecture 6 - Equivalent circuit for RC interconnects
Lecture 7 - Scaling effects in interconnects
Lecture 8 - Delay mitigation in RC interconnects
Lecture 9 - RC interconnect simulation
Lecture 10 - Inductive effects in interconnects
Lecture 11 - Distributed RLC interconnect model
Lecture 12 - Transmission line equations
Lecture 13 - When to consider the inductive effects?
Lecture 14 - The transfer function of an RLC interconnect
Lecture 15 - Time domain response of a lumped RLC circuit
Lecture 16 - Equivalent Elmore model for RLC interconnects
Lecture 17 - Two-pole model of RLC interconnects from ABCD parameters
Lecture 18 - RLC interconnect simulation
Lecture 19 - Origin of the skin effect
Lecture 20 - Effective resistance at high frequencies
Lecture 21 - Equivalent circuit to simulate skin effect
Lecture 22 - Power dissipation due to interconnects
Lecture 23 - Optimum interconnect width for minimizing total power dissipation
Lecture 24 - Heating effects and thermal modeling
Lecture 25 - Compact thermal modeling with equivalent electrical circuits
Lecture 26 - Electromigration in interconnects
Lecture 27 - Mitigation of electromigration
Lecture 28 - Capacitive coupling in interconnects
Lecture 29 - Cross-talk and timing jitters in two identical interconnects

Lecture 30 - Coupling effects and mitigation techniques
Lecture 31 - Matrix formulation of coupled interconnects
Lecture 32 - Coupled RLC interconnects
Lecture 33 - Decoupling of interconnects by diagonalization of matrix
Lecture 34 - Analysis of coupled interconnects: Examples - 1
Lecture 35 - Analysis of coupled interconnects: Examples - 2
Lecture 36 - Simulation of RC coupled interconnects
Lecture 37 - Extraction of capacitance - Part 1
Lecture 38 - Extraction of capacitance - Part 2
Lecture 39 - Extraction of inductance - Part 1
Lecture 40 - Extraction of inductance - Part 2
Lecture 41 - Estimation of interconnect parameters from S-parameters