

Switched-capacitor power converters

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SECURE CONNECTIONS
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Lecture I – Outline:

1. Introduction to SCPC
2. Charging a capacitor: energy transferred and lost
3. Average model
4. Analysis of a voltage doubler: average model and basic definitions
5. Analysis of a $M=1/3$ SCPC.
6. Generic analysis of 2-phase power converter.
7. More ratios, more topologies.
8. Step-up / Step-down duality

Lecture II – Outline:

1. Summary of Lecture I
2. Analysis of voltage across devices
3. Switching losses of an SCPC
 - a) Bottom-plate losses
 - b) Gate-driving losses
 - c) Non-overlapping circuits
4. Output ripple of SCPC
5. Control of SCPC
6. Interleaved SCPC
7. Design exercise



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