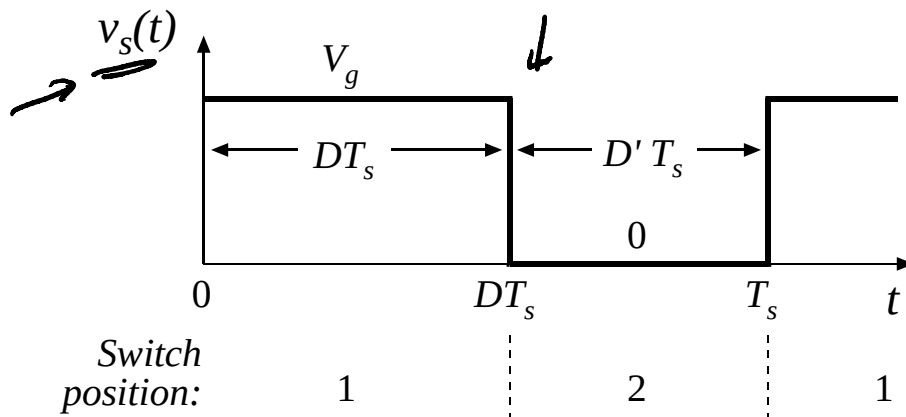
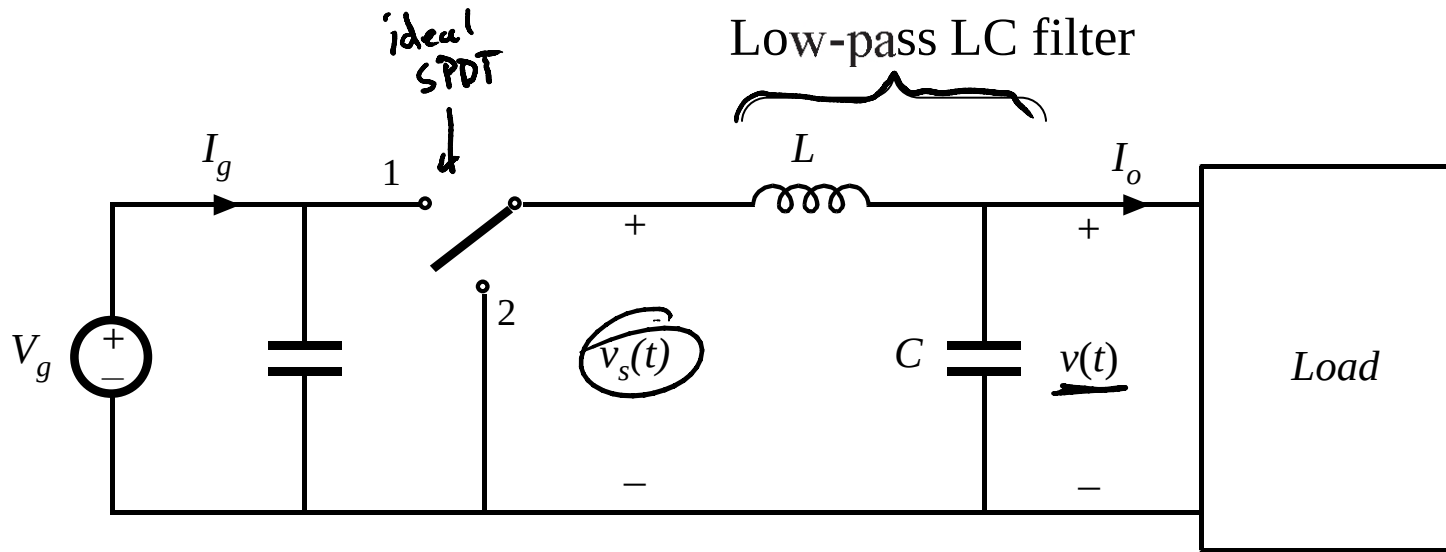


Lecture #40

- Today
 - • Continue power converter regulation example
 - • Implementation of circuit blocks
- { • FCQ this week
 - Receive e-mail instructions & code from FCQ.Office@colorado.edu
- Final exam: Tuesday, Dec. 13, 7:30pm – 10:00pm

Buck (step-down) switching power converter*



$f_s = 1/T_s =$ switching frequency

$D =$ switch duty cycle

Conversion ratio:

$$M(D) = \frac{V_o}{V_g} = \underline{D}$$

*ECEN5797 Introduction to Power Electronics covers details of analysis, modeling and design of switched-mode power converters

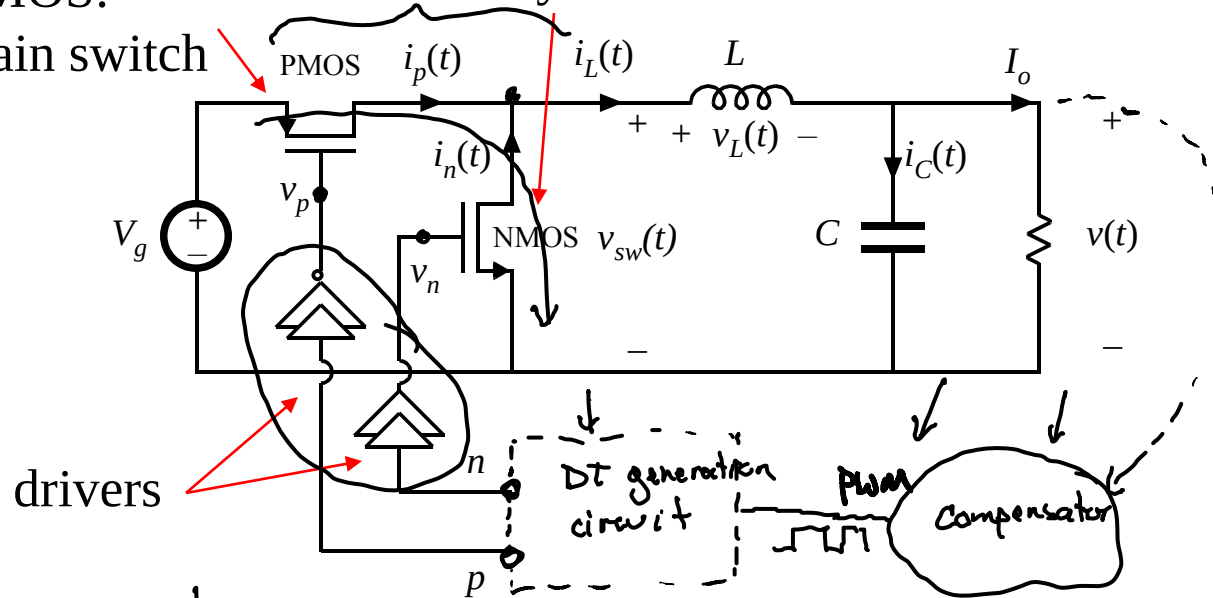
Switch realization with a synchronous rectifier

“Synchronous Buck”

PMOS:

main switch

NMOS: synchronous rectifier



drivers

DT generation circuit

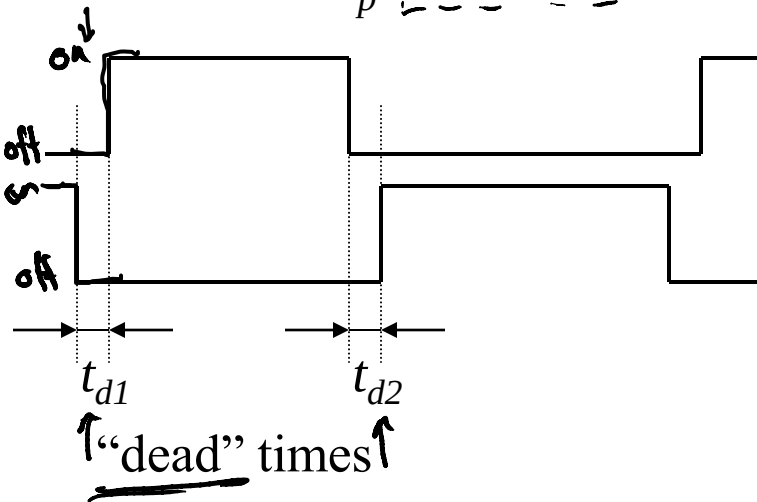
PMOS

Compensator

Switch control signals

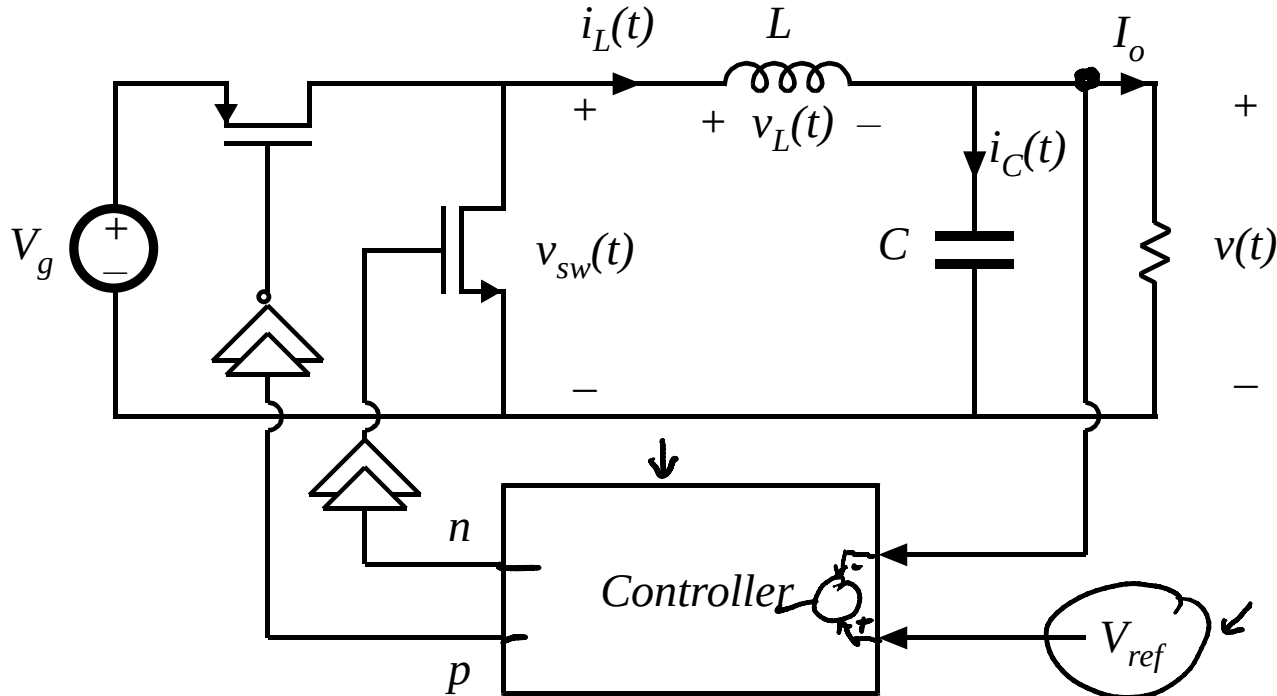
p

n



Dead times are used to prevent short-circuit current through PMOS/NMOS

Closed-loop (feedback) control



- The output voltage is compared to a bandgap reference V_{ref}
- The controller generates pulsating switch-control waveforms (p and n) to (ideally) null the error
- Bandgap design is critical for voltage-regulation and I_Q specs

以上内容仅为本文档的试下载部分，为可阅读页数的一半内容。如要下载或阅读全文，请访问：<https://d.book118.com/577161144015006121>