



[Visit Suncam.com for more courses](http://www.suncam.com)

Continuing Education Course #071
Switchmode Boost Power Converter
Using Voltage-Mode Control

1. Reasons for using a Boost power converter include:
 - a. the output voltage is higher than the supply voltage,
 - b. high conversion efficiency is required,
 - c. a switch-mode solution is acceptable,
 - d. all of the above.
2. Average input and output currents to a Boost converter are nearly equal:
 - a. True,
 - b. False.
3. The inductor current in a Boost converter is:
 - a. constant,
 - b. rectangular waveshape,
 - c. DC plus a triangular waveshape,
 - d. DC plus a rectangular waveshape.
4. The inductor voltage in a Boost converter is:
 - a. constant,
 - b. rectangular waveshape,
 - c. DC plus a triangular waveshape,
 - d. DC plus a rectangular waveshape.
5. DC resistance of the inductor in a Boost converter contributes to power loss:
 - a. True,
 - b. False.
6. Output capacitor ripple voltage in a Boost converter depends on inductor ripple current:
 - a. True,
 - b. False.
7. Line regulation relates the output voltage changes due to supply changes:
 - a. True,
 - b. False.
8. Load regulation relates the output voltage changes due to supply changes:
 - a. True,
 - b. False.
9. The feedforward control in a Boost converter is primarily employed to improve:

- a. line regulation,
- b. load regulation,
- c. both of the above,
- d. none of the above.

10. The inductor/capacitor combination in a Boost converter can introduce an underdamped resonance in the control loop of a Boost converter:

- a. True,
- b. False.

11. The complex-conjugate pole pair in a Boost converter depends on:

- a. the duty-cycle at the operating point,
- b. the load applied to the converter,
- c. the inductor/capacitor combination,
- d. all of the above.

12. The Pole-Zero (PZ) compensator for voltage-mode control uses an integrator pole for:

- a. higher DC gain,
- b. cancellation of resonance induced phase,
- c. PZ compensator bandwidth limitation,
- d. none of the above.

13. The Pole-Zero (PZ) compensator for voltage-mode control uses two zeroes for:

- a. higher DC gain,
- b. cancellation of resonance induced phase,
- c. PZ compensator bandwidth limitation,
- d. none of the above.

14. The Pole-Zero (PZ) compensator for voltage-mode control uses two poles for:

- a. higher DC gain,
- b. cancellation of resonance induced phase,
- c. PZ compensator bandwidth limitation,
- d. none of the above.

15. Switchmode sampling introduces a Zero-Order Hold delay in the feedback loop:

- a. True,
- b. False.

16. Switchmode sampling introduces a Nyquist “notch” in the feedback loop:

- a. True,
- b. False.

17. The pulse-reset sawtooth Pulse-Width Modulator (PWM) can support:

- a. feedforward control,
- b. feedback control,
- c. both feedforward and feedback control,
- d. none of the above.

18. A soft-start reference ramp can be used to:

- a. limit starting current from the supply,
- b. avoid control saturation at startup,

- c. both of the above,
- d. none of the above.

19. A Boost converter with voltage-mode control cannot start with the load applied:

- a. True,
- b. False.

20. An otherwise stable Boost converter with voltage-mode control can momentarily encounter duty cycle limiting when a transient load is applied suddenly:

- a. True,
- b. False.

21. An otherwise stable Boost converter with voltage-mode control can momentarily encounter duty cycle limiting when a transient load is removed suddenly:

- a. True,
- b. False.

22. Required average inductor current changes in a voltage-mode controlled Boost converter are associated with non-zero feedback error voltages:

- a. True,
- b. False.

23. Sampling a Boost converter with a longer period generally requires larger inductor and capacitor values:

- a. True,
- b. False.

24. For the example synchronously switched Boost converter with a 14.7V input, 28V output, 190 nsec **D** switching period, and a maximum 100 milli-Ampere peak-to-peak ripple current, the inductor must be:

- a. less than 27.9 μH ,
- b. more than 27.9 μH ,
- c. none of the above.

25. For a synchronously switched Boost converter with a 14.7V input, 28V output, 190 nsec **D** switching period, and a maximum 1 Ampere load current, the output capacitor must be,

- a. less than 4 μF ,
- b. more than 4 μF ,
- c. none of the above.

[Purchase this course on Suncam.com](http://Suncam.com)