

6.002 Demo# 28

Boost Converter

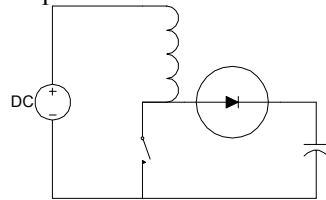
Lecture 24

Agarwal Fall 00

Purpose:

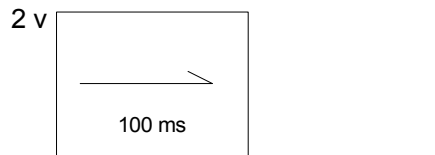
A DC/DC converter using a Boost Topology

Steps:

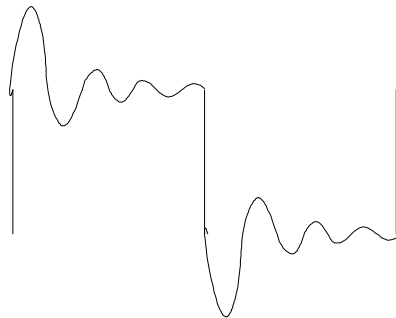


1 – Short the diode show series LC response

Input:



Output:

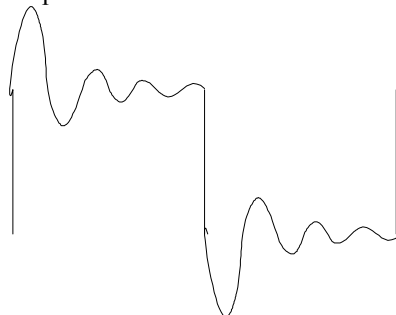


2 – 5V Supply at input, pulse the switch (diode still shorted)

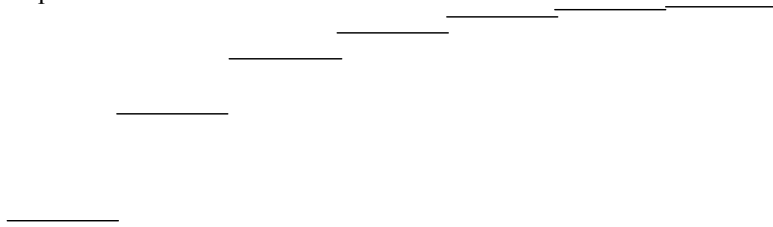
input:



output:



3 – 5V Supply at input, pulse the swith (diode now in circuit)
output:



Procedure:

Demo #1

- * Signal Generator (S1 on gen) [Square wave 2v peak from gnd, and 16 ms width]
- * Pulse Generator (off)
- * Diode D1 (Shorted, S4 on D shorted)

Scope settings:

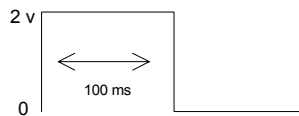
Vert CH2 = 1v/Div

Vert CH4 = .1v/Div x 10 (Using scope probe)

Sweep = 2 ms/Div

Coupling = DC

Trig = EXT



Demo # 2

- * 5 v Supply (S1 on 5v)
- * Pulse Gen (S2 on) [Pulse Duration = .1 ms; Variable ~ 10:00 ; Period = 20 ms, Variable ~ 1:00]
- * Diode D1 (Shorted, S4 on D shorted)

Scope settings:

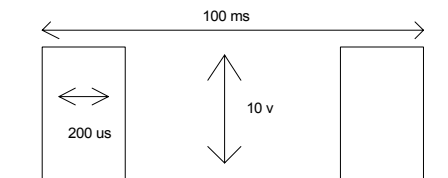
Vert CH2 = 5v/Div

Vert CH4 = .5v/Div x 10 (Using scope probe)

Sweep = 10 ms/Div

Coupling = DC

Trig = EXT



Demo # 3

- * 5 v Supply (S1 on 5 v)
- * Pulse Gen (S2 on) [Pulse Duration = .1 ms; Variable ~ 12:00; Period = 20 ms; Variable ~ 11:00]
- * Diode D1 (Open, S4 on D open)

Scope settings:

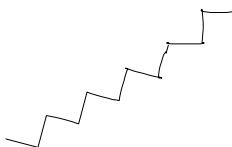
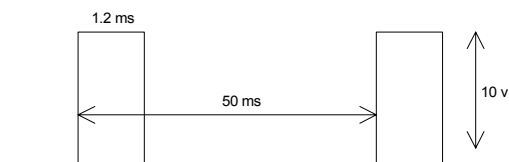
Vert. Ch2 = 5v/Div

Vert. CH4 = 1v/Div x 10 (Using scope probe)

Single sweep = .2 ms/Div

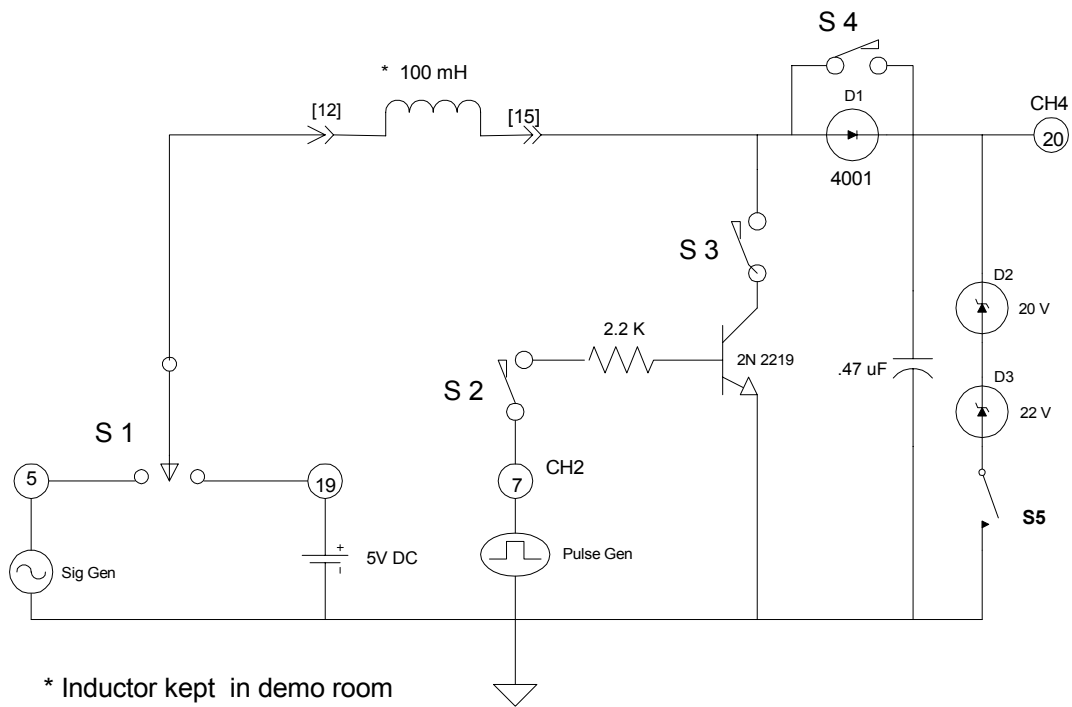
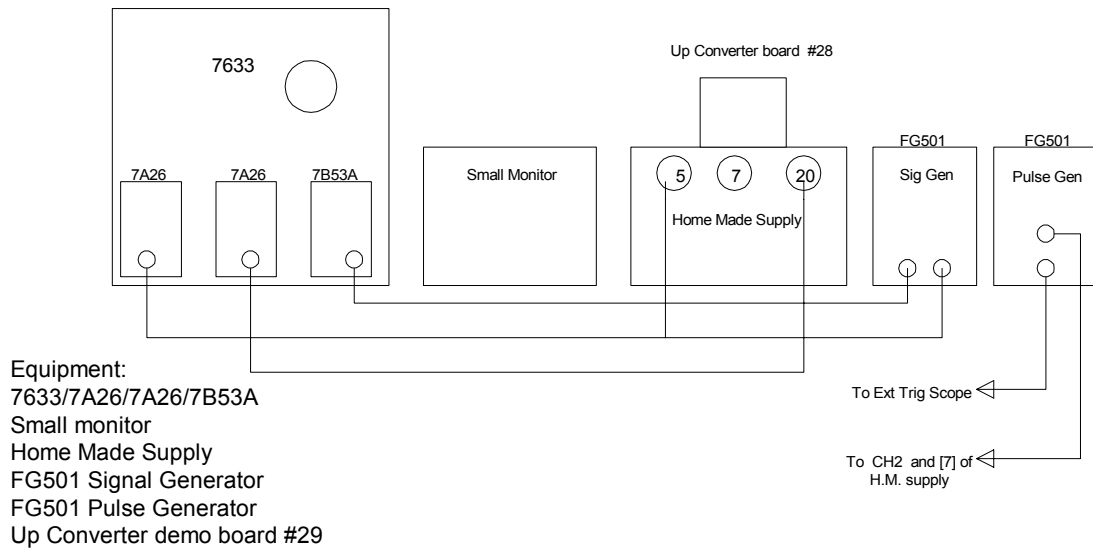
Coupling = DC

Trig = EXT



6.002 Demo #28 Up Converter

Prof. Lang



* Inductor kept in demo room

S5 open for Demo#1 ONLY