Power Supply Essentials
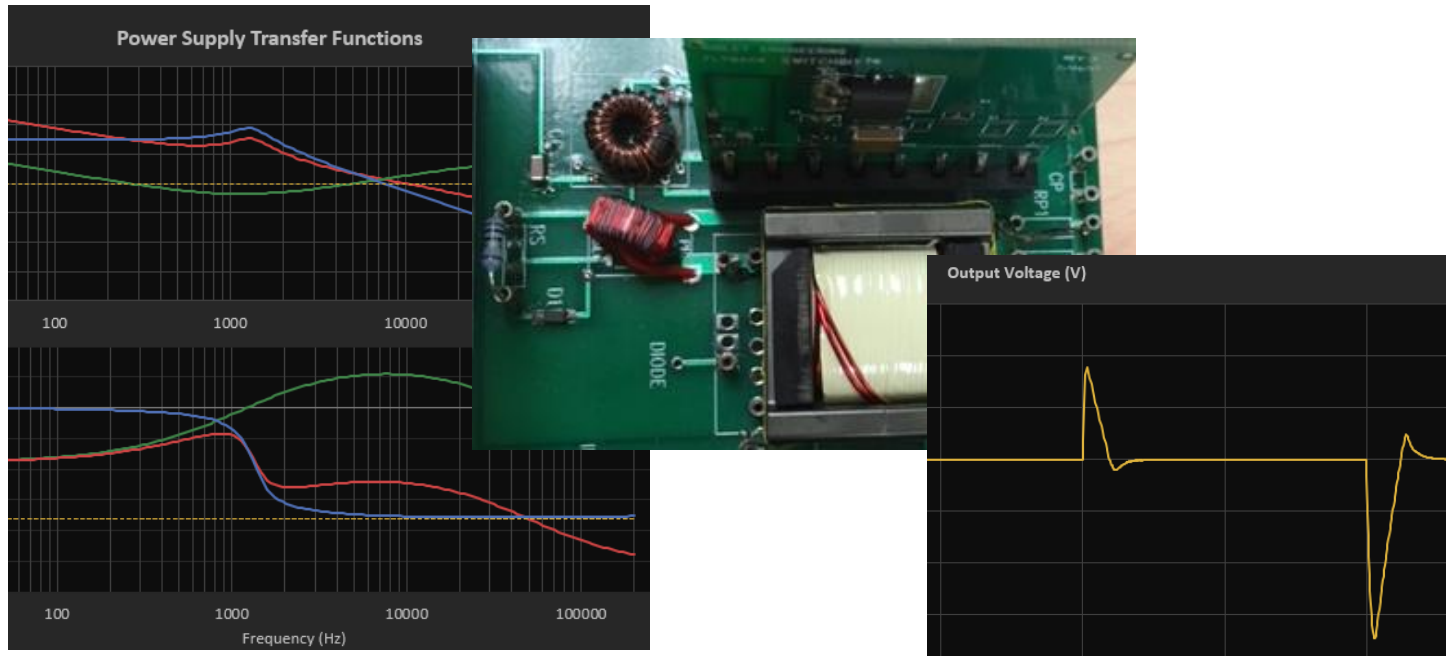

Webinar May 29, 2020 10:00 am PCT

Dr. Ray Ridley   Ridley Engineering

Please Download the Handout

Ridley Engineering

Download and Install RidleyWorksDemo Software

RIDLEYWORKS® DOWNLOADS

On this page, you can download the current user manual and the demo version of RidleyWorks.

USER MANUAL RIDLEYWORKS (VERSION 14.10)

Download RIDLEYWORKS Manual

RIDLEYWORKSDEMO (VERSION 14.13)
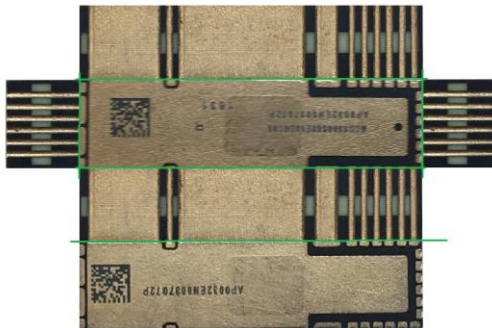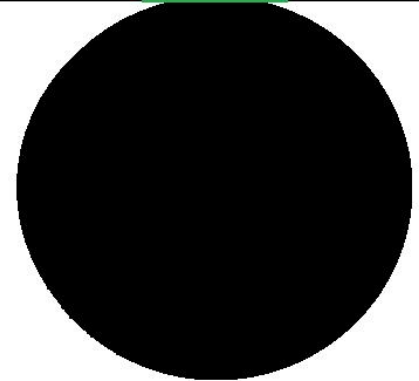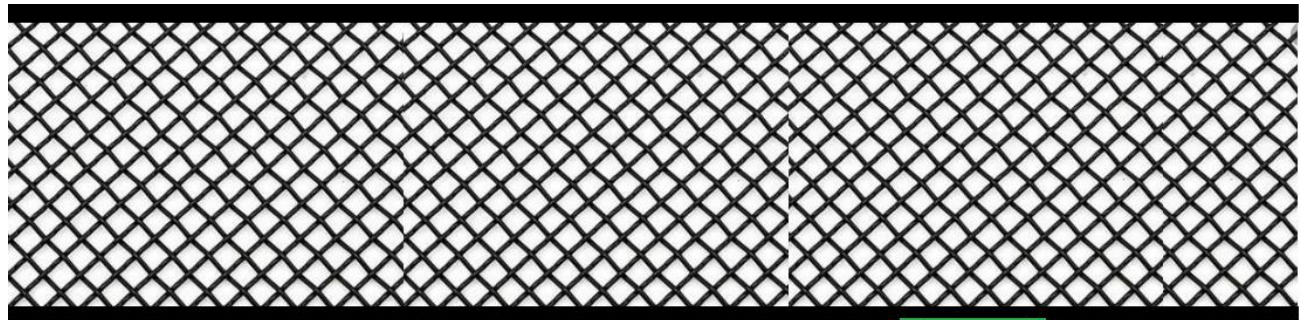
Download RIDLEYWORKS Demo

http://ridleyengineering.com/software-ridley/ridleyworks/software-ridley-works-dowloads.html#
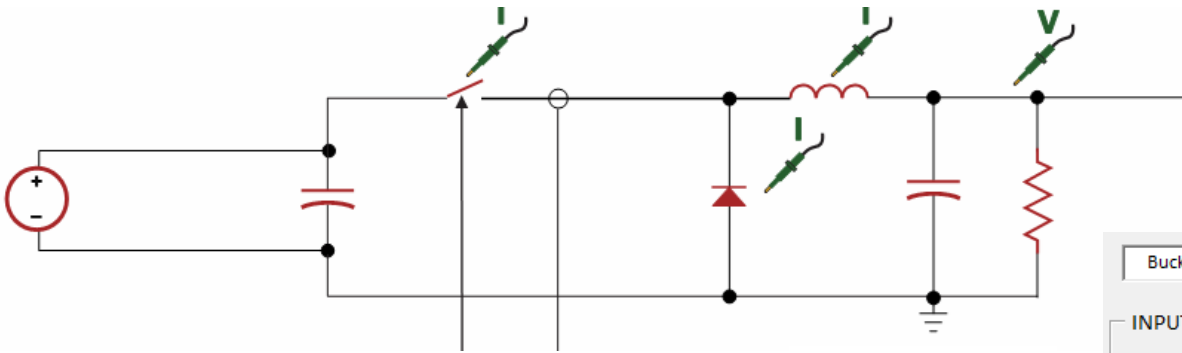
A Small Project for you (Scissors and tape needed)

Print this page

Cut out, fold on green lines, and assemble the following objects

Buck Converter Design Specifications

Power Converter Design Process (Cookbook Rules)

Choose **switching frequency** according to power

$$40 \leq f_s \leq 300$$
$$f_s = 300 - 75\log(P)$$

Choose **Inductor Value** for Ripple Current

$$\Delta I_{p-p} = 0.3 I_o$$

Choose **Capacitor** for:

Ripple current capacity
Resonant frequency

$$f_r < 0.02 f_s$$

Step load capability

Power Converter Design Process (Cookbook Rules)

Choose **FET** for 1% conduction loss, voltage rating

$$I_{sw}^2 R_{ds} = 0.01P$$

Choose **Diode** for voltage breakdown, current rating

Make sure packages can handle the power dissipation

Custom design, or find standard **Inductor**

LAST step: when all is done, find a controller to meet your needs

Power Converter Design Process Results

What do you see here?

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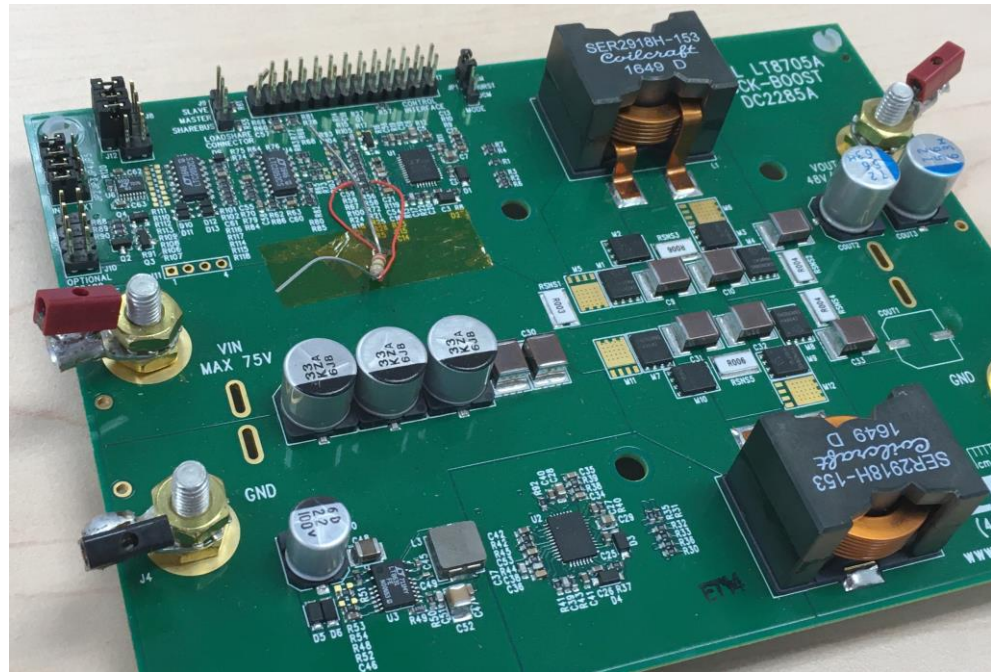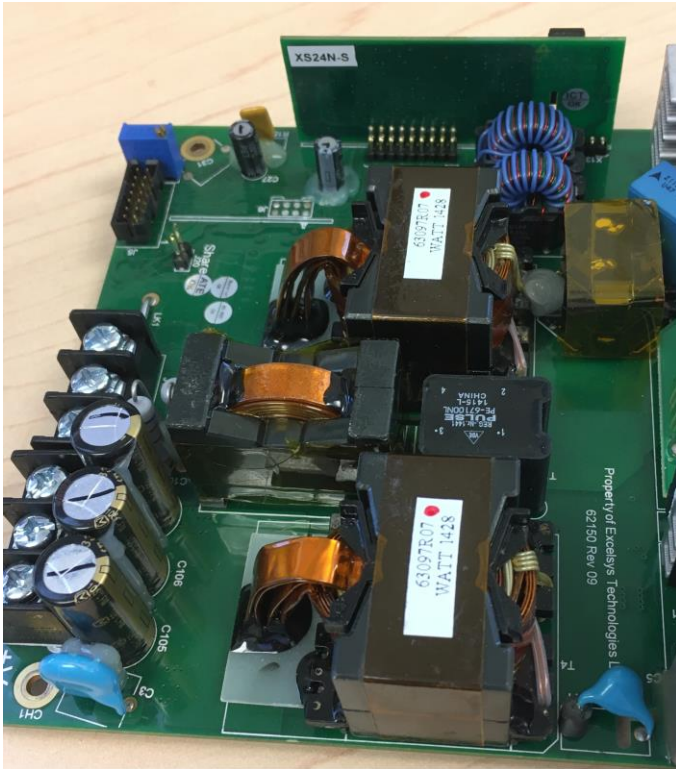
To Move Forward We Have to do More

Minimize inductive energy storage

Move to zero voltage switching

The two objectives can go together

Better/custom controllers

New devices

No voltage-mode control!

Change the rules

New rule number one – try to forget the rules!

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How to Learn More

RIDLEY WORKS®

Email info@ridleyengineering.com
For full demo

Frequency Response Analyzers

A New Small-Signal Model
for Current-Mode Control

Raymond B. Ridley
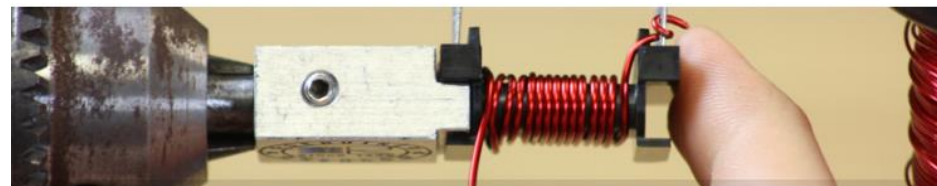
Free Book

> Education > Power Design Workshop > Intro

POWER SUPPLY DESIGN WORKSHOPS

David Edwards
April 21 at 11:54 PM

Attached is the LTspice simulation schematic and loop-gain plot for the original UcD amplifier. This is taken from a transient simulation that is post processed with measurement statements to provide loop-gain in the time domain like a laboratory frequency response analyzer.

On my computer the simulation takes twenty minutes to process four curves of 101 points each (404 points total at about three seconds per point). Without the stepped dc bias a single run would take a... See More

Power Supply Design Center Facebook Group

Power Supply Design Center Articles

| [113] THE ADVENTURES OF 'OHM	[112] THE POWER OF DOWELL'S EQUATIONS AND CURVES	[A24] FLYBACK CONVERTER SNUBBER DESIGN	[111] ZVS FULL-BRIDGE CONVERTER EMPLOYING AN ACTIVE SNUBBER
This custom-designed comic strip is for all the electrical engineers who are suddenly working from home.	The standardized curves of Dowell's equations are a superb tool for designing better high-frequency magnetics. A careful balance of layer count and wire or foil count is needed to reach an optimum design.	In this article, we will talk about practical design techniques for the most commonly used snubber and clamp circuits for the flyback converter.	The ZVS full bridge converter can be enhanced greatly by implementing an active snubber on the secondary side of the transformer.

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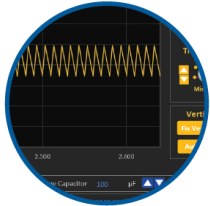
RidleyWorks® Lifetime License

Power Stage Designer
Power Stage Waveforms
Magnetics Designer
Transfer Function Bode Plots

Closed Loop Design
Automated FRA Control
LTspice® Automated Link
PSIM® Automated Link
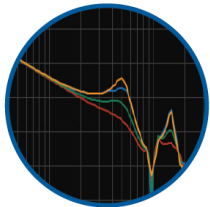
4-Channel Frequency Response Analyzer

Frequency Range 1 Hz - 20 MHZ
Source Control from 1 mV - 4 V P-P
Built-In Injection Isolator
Bandwidth 1 Hz - 1 kHz
Automated Setup from RidleyWorks®
Drect Data Flow into RidleyWorks®
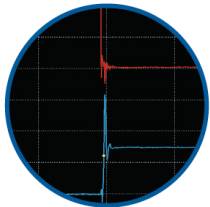
4-Channel 200 MHz Oscilloscope

Picoscope® 5444D 4-Channel Oscilloscope
200 MHz Bandwidth
1 GS/s at 8-bit res; 62.5 MS/s at 16-bit res
Signal Generator up to 20 MHZ
Computer Controlled
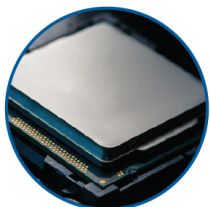
Embedded Computer

Intel® Computer with 32 GB RAM, 256 GB SSD
Intel® HD Graphics 620
Integrated Dual Band Wireless, Bluetooth 4.2
Dual HDMI and USB Ports, Ethernet

Differential Probes

Line Injector

Accessories

Output Impedance

Impedance Test Kit

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