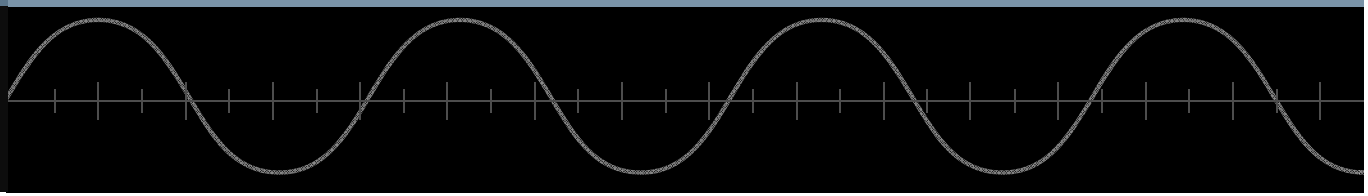
Designing a Power Supply in Five Simple Steps

With **LTpowerCAD** Design Tool



LINEAR TECHNOLOGY

How People Do a “Paper Design”:

- For a **switching mode supply**:
  1. Define supply spec.
  2. Decide topology.
  3. Search for an IC (- time consuming)
  4. Calculate power components (- time consuming and not optimum)
  5. Search/select real components: L, C, FET... (-time consuming & not optimum)
  6. Guess efficiency/loss (- difficult, inaccurate)
  7. Guess or simulate for loop compensation. (- difficult, inaccurate)
  8. Draft a schematic.

- ☹ **Time consuming, difficult, inaccurate, not optimum.**
- ☹ **Requires good knowledge and skills.**
- ☹ **Hours or days of efforts!**

LTpowerCAD Power Supply Design Tool

- **Free-download at www.linear.com/LTpowerCAD**
  - First released on 2014. Supports > 200 LTC ICs.
  - Hundreds/thousands power components.
- **Frequent updates / improvements. (sync/release)**
- **No internet bandwidth/speed limit. - Runs on** Windows PC with installation. Leverage powerful user PC with high security.
- **Developed by Power Engineers/Experts.**
- **Easy, fast and high quality designs.**

LTpowerCAD Tool Simplifies Supply Design Task

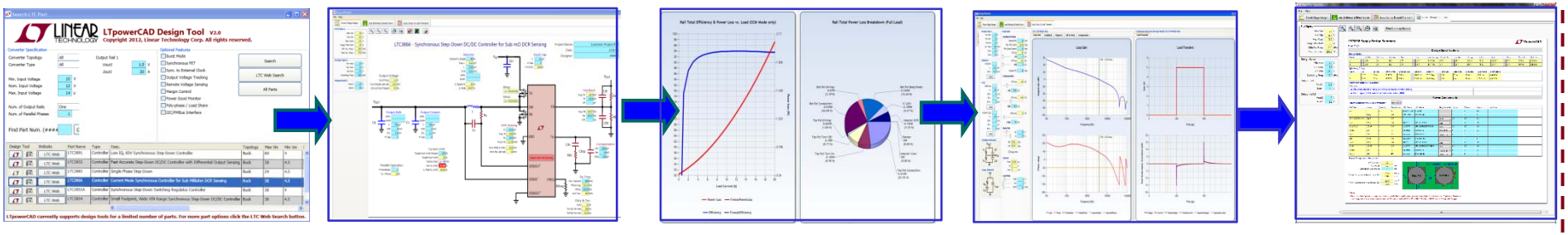
5 Simple Steps:

1. Enters supply spec. to search for right solutions (fast).
2. Design tool guides users to select power components. (fast & easy, optimum).
3. Real time efficiency and loss optimization (fast & easy, more accurate)
4. Real time loop gain and transient design & optimization (fast, easy and accurate)
5. BOM summary and size estimation (fast & easy)
6. (OPT) Export to LTspice for dynamic simulation and schematic.

- ☺ Fast, accurate with optimum results.
- ☺ Easy task even for inexperienced designers.
- ☺ A “paper-design” can be done in minutes!

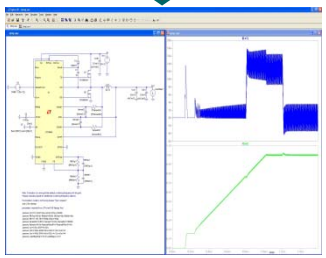
Design a Supply in 5 Simple Steps:

Step 1	Step 2	Step 3	Step 4	Step 5
Enter specs, search solution.	Power Stage Design.	Efficiency & Loss	Loop & Transient	Summary, BOM, Size



LTpowerCAD

(OPT.)

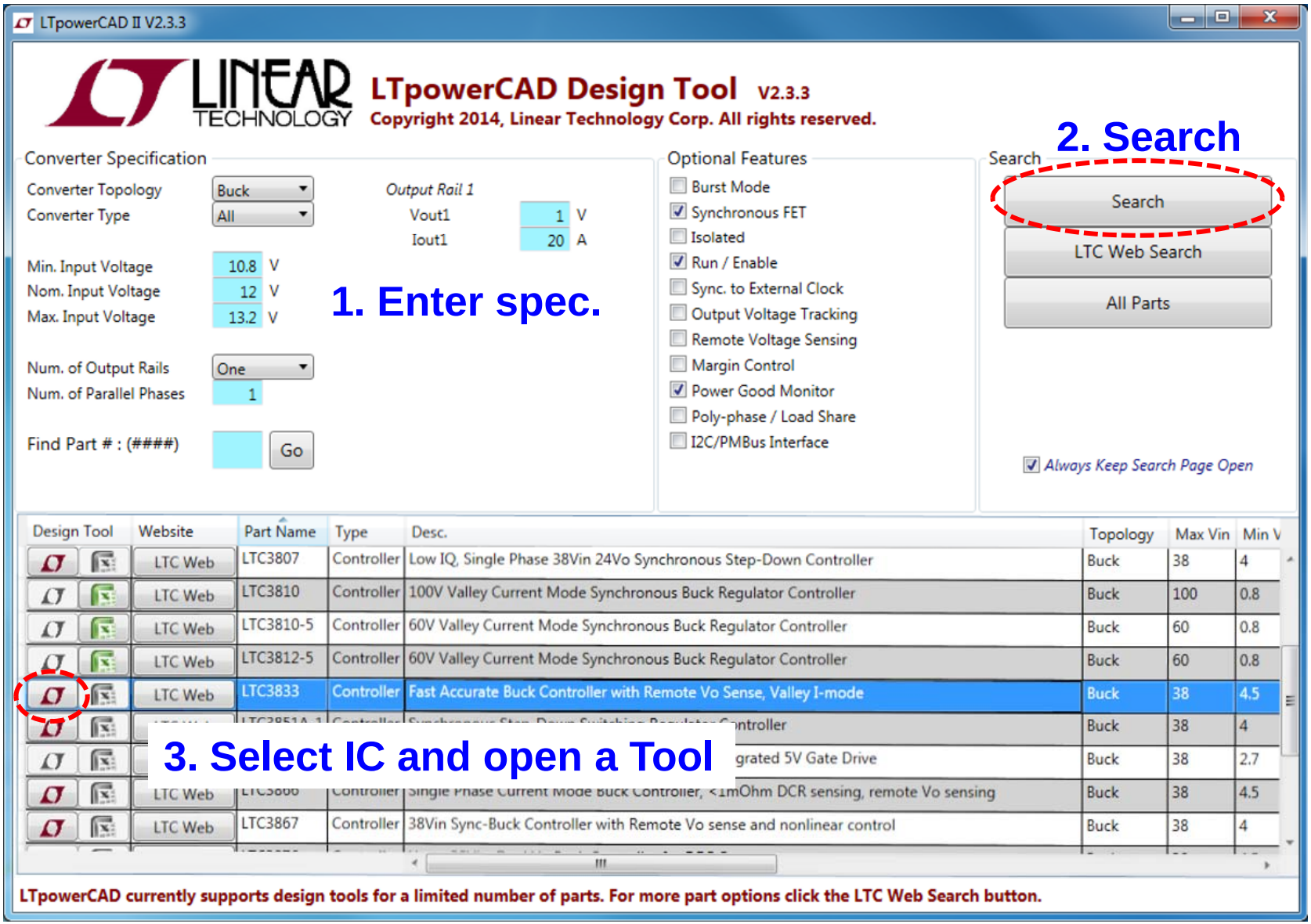


LTspice™ Simulation

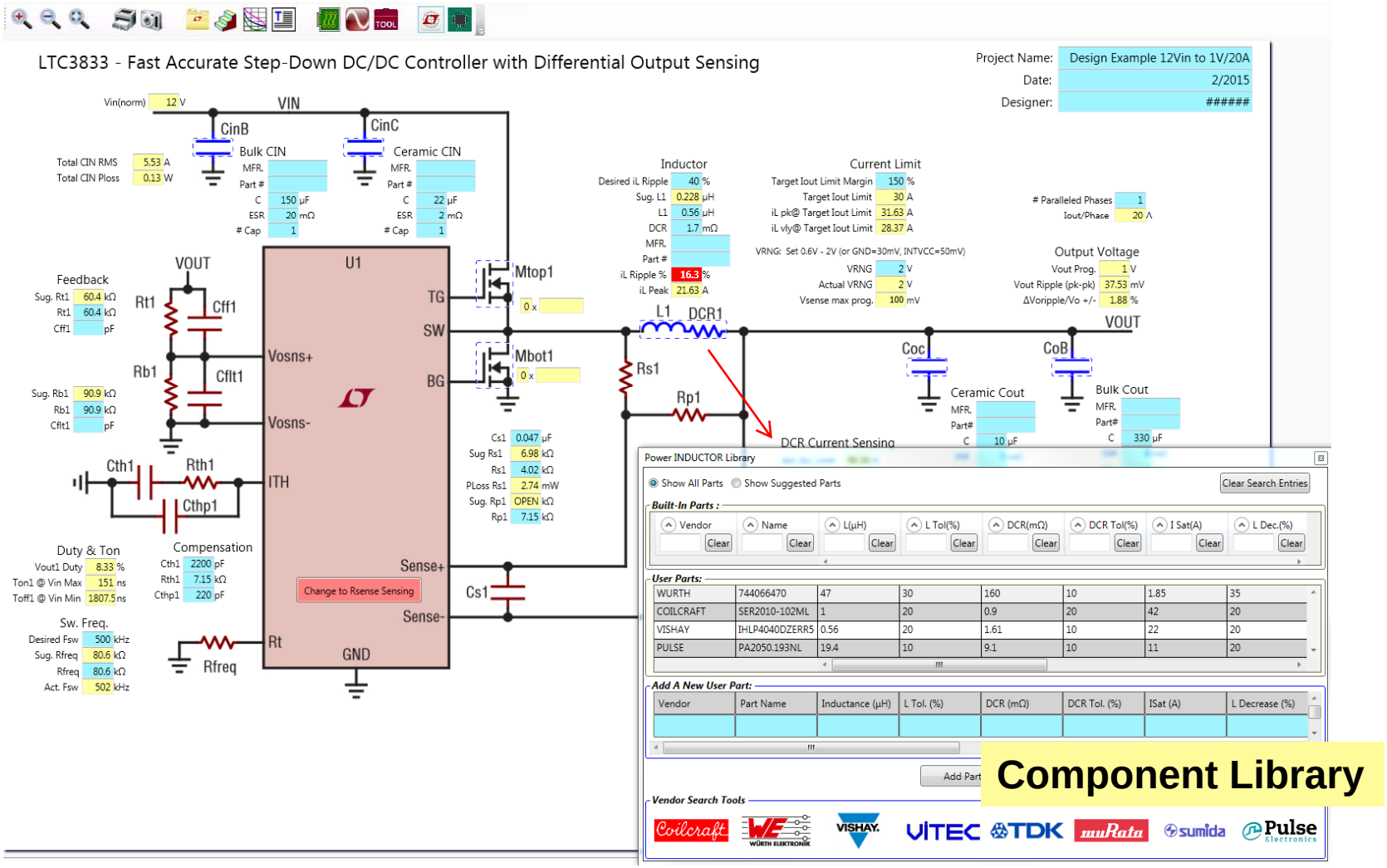
LTpowerCAD Supply Design Example

- **Vin = 12V +/-10%**
- **Vo=1.0V, Io=20A**
- **Step Down Buck Converter**

Design Step 1 – Search Part for Spec.



Design Step 2 – Power Stage Design

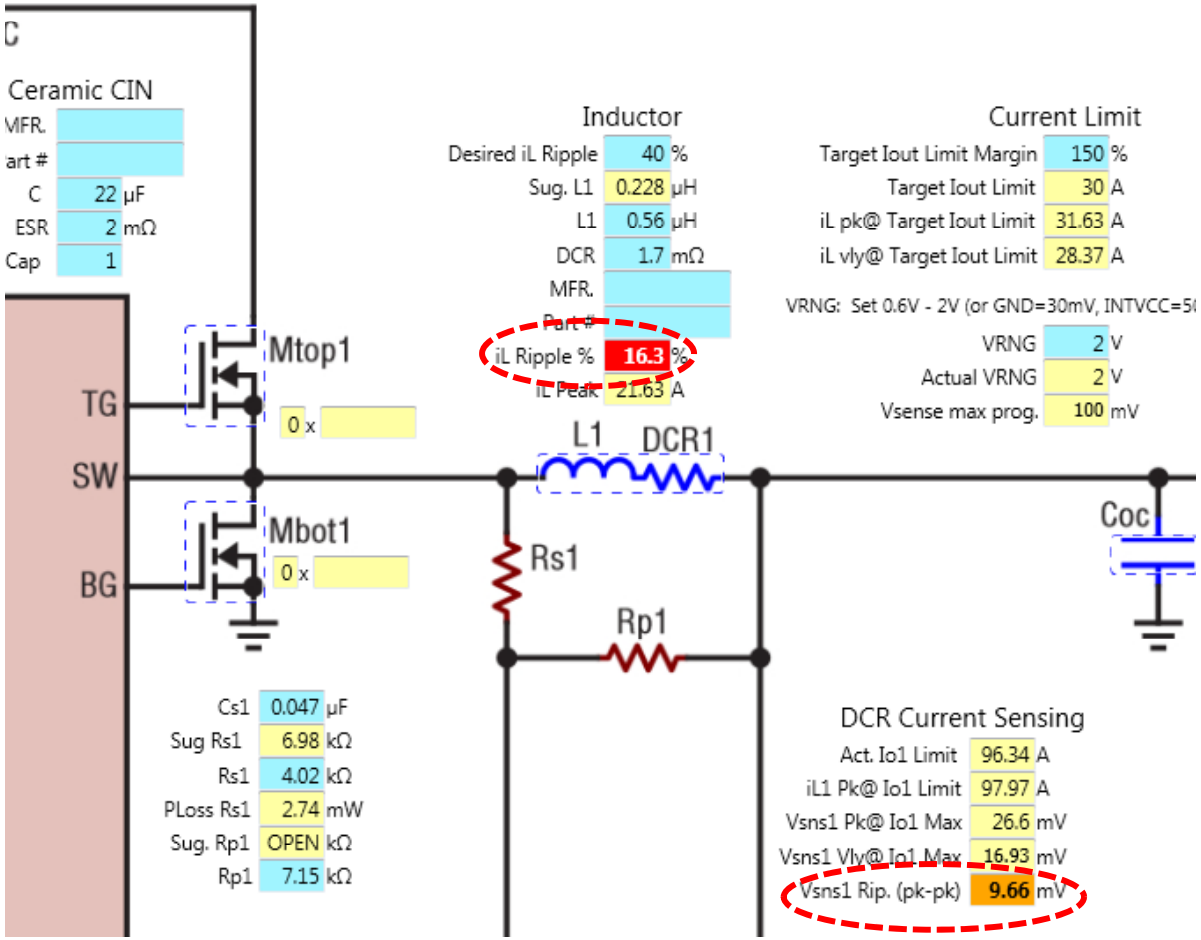


Component Library

- Recommended values

- User entered values

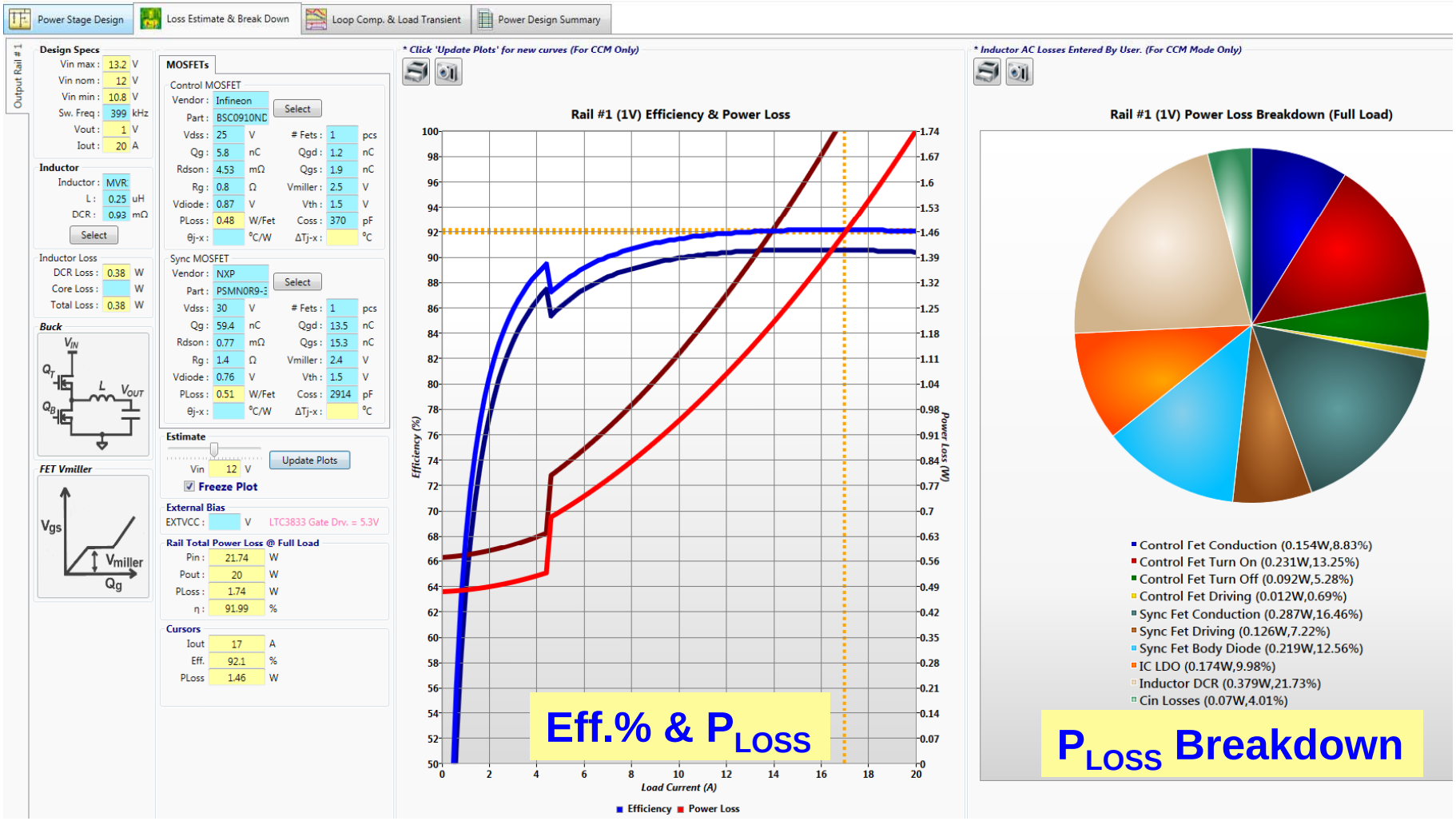
Design Step 2 – Power Stage – Design Warnings



- Strong warning
- Soft warning

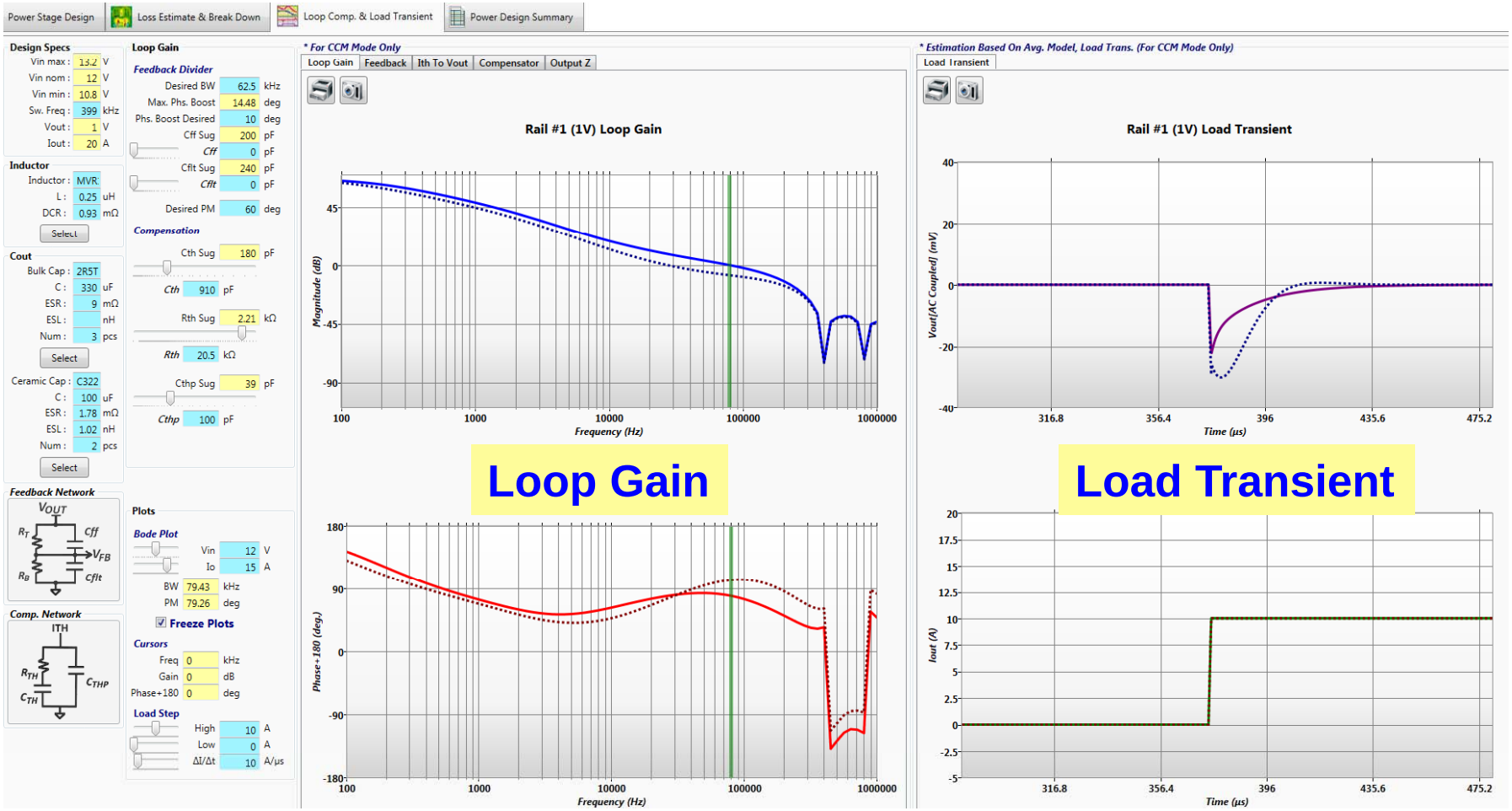
- Automatic warnings guide users for proper values

Design Step 3 – Efficiency & Loss Optimization



- **Real time estimation/comparison for optimum efficiency**

Design Step 4 – Loop and Transient Design



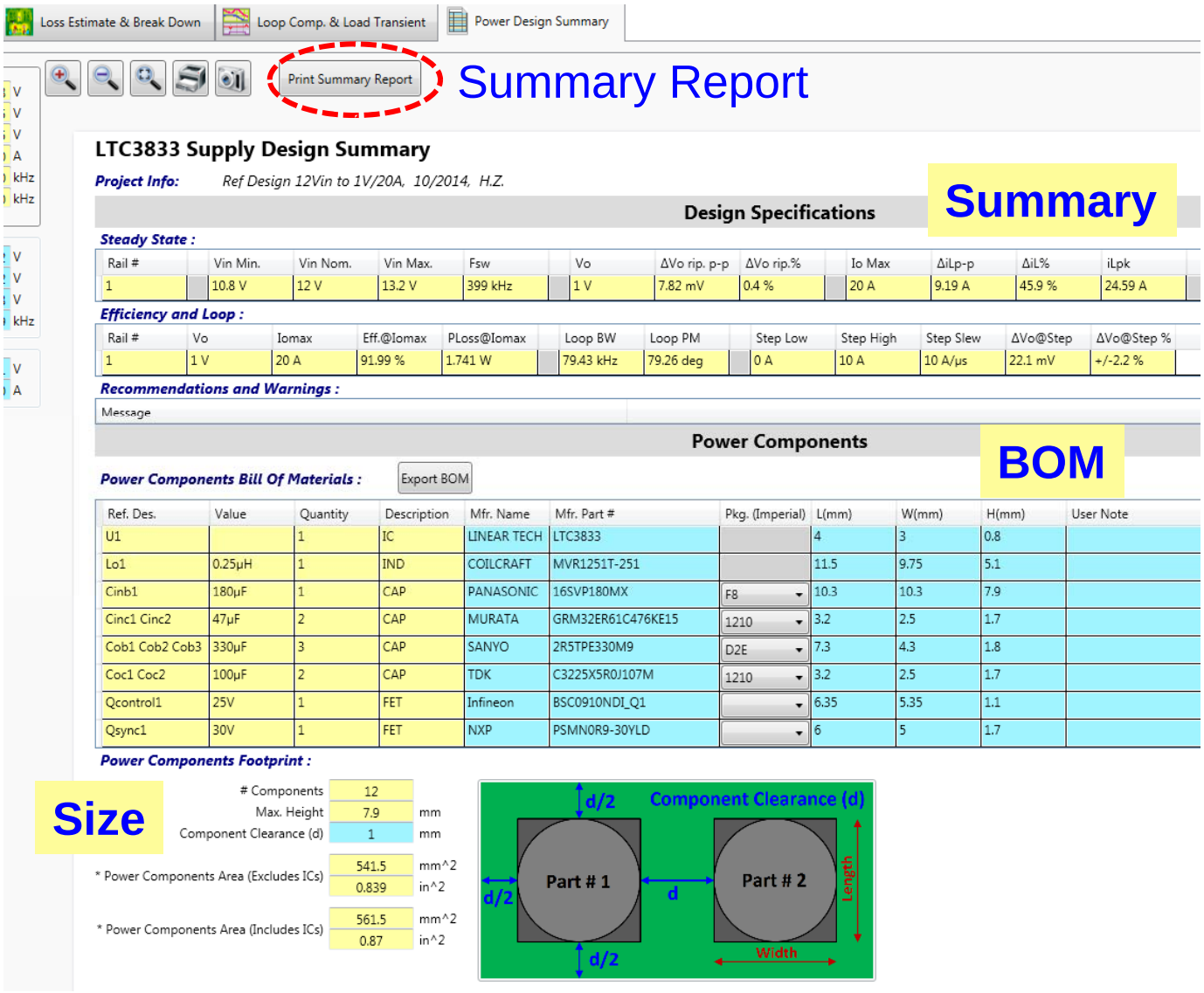
Loop Gain

Load Transient

- **Real time loop design and transient optimization**

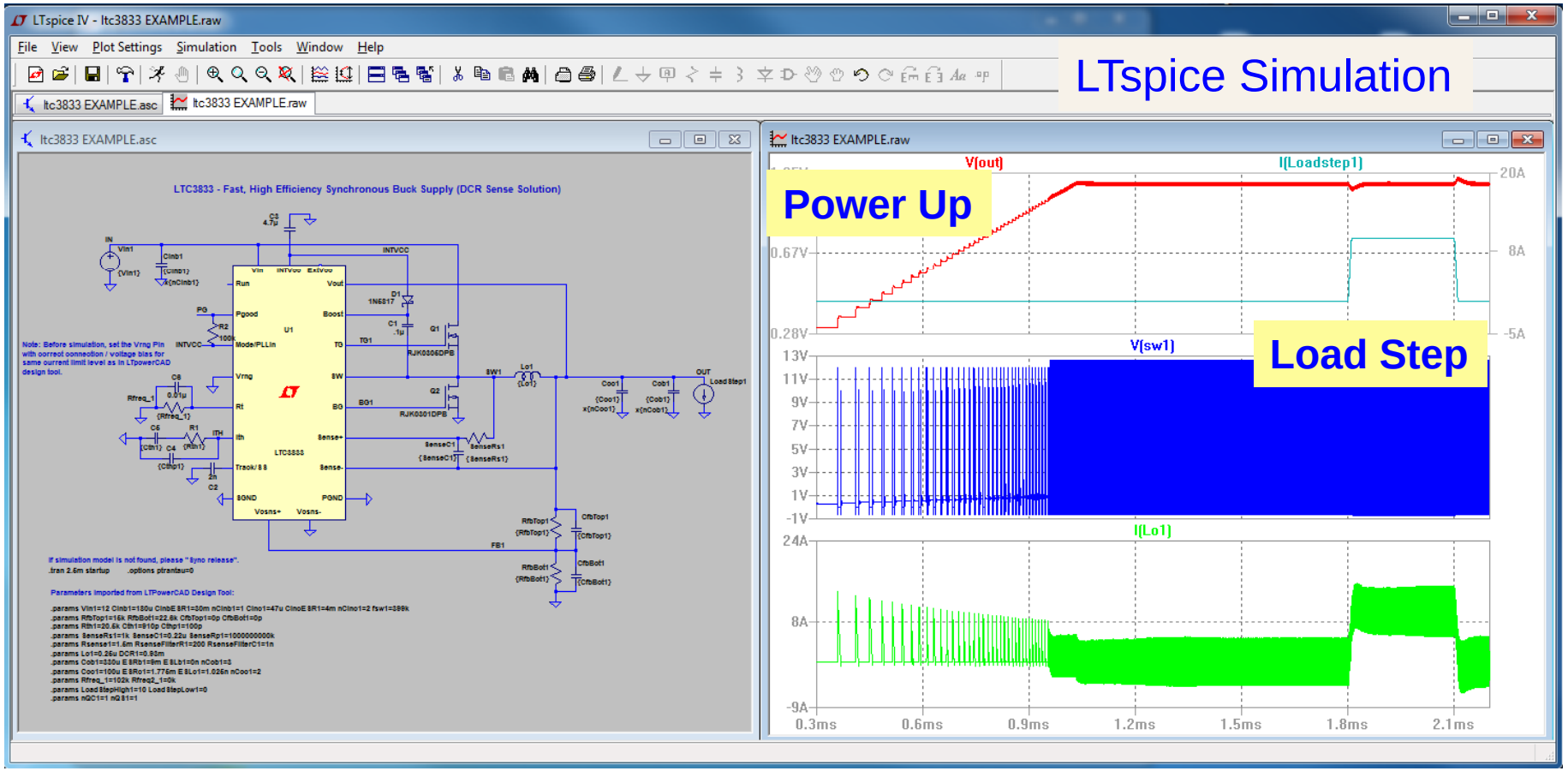
(All IC loop models have been verified on LTC demo boards)

Design Step 5 – Summary, BOM and Size



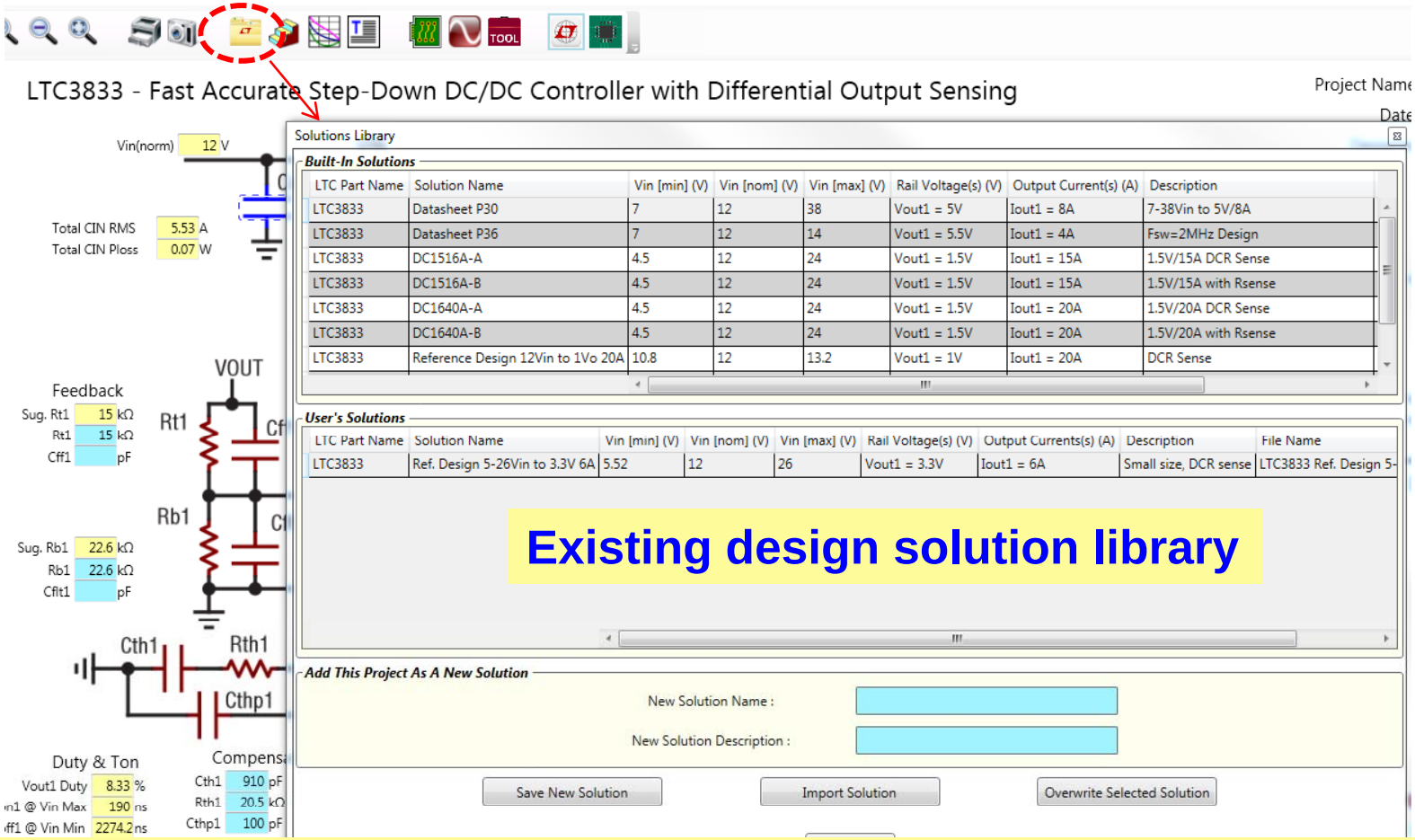
(Optional) Step 6 – Export to LTspice Circuit

- To see detailed waveforms and transient performances



(Key LTpowerCAD design tool values are exported to LTspice)

Design “Shortcut” – Solution Library



- **Many solutions/designs are already in “solution library”. Users can add/build their solutions too.**
- **Leverage existing designs.**
- **Quick start point of a new design!**

Summary

LTpowerCAD tool makes your job easier.

- Save time.
- Easy steps.
- High quality designs.

Questions? - LTpowerCAD@linear.com