

Technical Article

Power up with SIMPLE SWITCHER® Products and New WEBENCH® Tools



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Let's start with a hypothetical:

Your name is Floyd. You're a digital designer. You have spent your entire career programming FPGAs. Back in college you took the introductory analog classes, but you loved digital systems and took every available course in that track on your way to a BSEE degree.

Anyway, you wanted a challenge and recently started working with a much smaller company that doesn't have a resident power management guru. Sure, you've seen power schematics and know the basic topologies, but you've never been responsible for designing a power supply from the ground up (pun intended). On top of that, your boss asked you to submit your first schematic for the entire design by the end of the week. Looks like you got that challenge you wanted...

Slightly panicked, you ask your cubicle neighbor what power management devices he recommends. He doesn't even say anything, he just gestures towards a poster hanging on his wall....it's a product selection chart with a familiar name at the top "SIMPLE SWITCHER® Products" and a website link to SIMPLE SWITCHER.com - and that's when the magical journey of 'Design Made Easy' begins.

You see, SIMPLE SWITCHER exists at the intersection of easy-to-use devices and simple software. Every aspect of SIMPLE SWITCHER is about making life easier for DC/DC power management gurus and non-power experts alike, and it's been that way for a full quarter-century now. Nowhere else will you find a portfolio of devices specifically designed for ease-of-use and backed by the industry's most powerful suite of online design tools.

With this in mind, it comes as no surprise that the new SIMPLE SWITCHER product and tool website makes it easier than ever to find the right part using the parameters that you, the designer, care about most- efficiency, size and cost.

The screenshot shows the SIMPLE SWITCHER design tool interface. At the top, there's a search bar with the text "Find the right SIMPLE SWITCHER device for your design:". Below this, there are input fields for "Vin" (12.0 V), "Max" (24.0 V), "Vout" (5.0 V), and "Iout" (3.0 A), followed by an "Update" button. On the left side, there's a "Filters" section with checkboxes for "Integrated Inductor", "Synchronous Rectification", "New", "Leaded Package", and "Automotive Only". Above the filters is an "Optimize results" section with a dial for "Lowest BOM Cost" and "Smallest Footprint" vs "Highest Efficiency". The main part of the interface is a table of search results:

Part	Interactive Design	Iout (max)	Efficiency	Footprint	BOM Cost	BOM Count	Datasheet	Samples	Evaluation Module
LM43603	Preview Design	3.0A	88.4%	287.0mm ²	\$2.74	12	D	C	E
LMR14030	Preview Design	3.5A	83.5%	291.0mm ²	\$2.5	10	D	C	E
LM43603-Q1	Preview Design	3.0A	88.4%	287.0mm ²	\$3.07	12	D	C	E
LMR14050	Preview Design	5.0A	84.0%	354.0mm ²	\$2.98	10	D	C	E
LM22676	Preview Design	3.0A	85.7%	423.0mm ²	\$3.08	13	D	C	E

Below the table, there are navigation buttons (1, 2, 3, 4, 5) and a "Results: 1 to 5 of 57" indicator. At the bottom right, there's a "Close" button and a link to "Need more help choosing? Use our step-by-step guide in [WEBENCH® Designer](#)".

Figure 1. Enter Your Parameters and Click "Update" to Instantly View the Best SIMPLE SWITCHER Solutions for Your Design. Optimize Your Results by Using the Dial and Checkboxes on the Left.

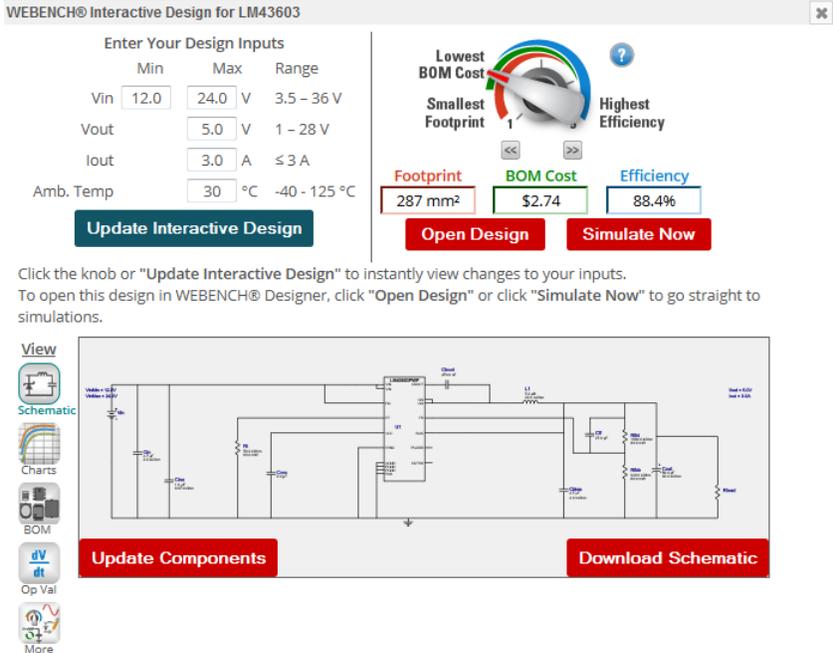
You know that all of the devices in the search results will be easy to use, because the SIMPLE SWITCHER design team has worked hard over the years so that you and Floyd don't have to. Innovative design

and advances in process technology have enabled the integration of external components as well as the minimization of solution sizes, all in an effort to simplify DC/DC design and get you to market faster. Some examples of said integration, at a glance:

- Integrated compensation networks take the hassle out of calculating optimal component values to ensure converter stability.
- Integrated FETs eliminate the need for freewheeling diodes in your design, while improving efficiency and tightening di/dt loops for better EMI performance.
- Integrated-inductor modules remove what is often the largest and most costly external component, while further tightening di/dt loops and reducing the total BOM count.

The model citizen of the power module community – [LMZ31710](#) – requires just three external components to enable a 17V, 10A power supply.

And with the new [WEBENCH](#) Interactive Design feature, you are only one click away from previewing a schematic for your design.



WEBENCH® Interactive Design for LM43603

Enter Your Design Inputs

	Min	Max	Range
Vin	12.0	24.0	V 3.5 – 36 V
Vout	5.0	V	1 – 28 V
Iout	3.0	A	≤ 3 A
Amb. Temp	30	°C	-40 - 125 °C

Update Interactive Design

Lowest BOM Cost, Smallest Footprint, Highest Efficiency

Footprint	BOM Cost	Efficiency
287 mm ²	\$2.74	88.4%

Open Design Simulate Now

Click the knob or "Update Interactive Design" to instantly view changes to your inputs. To open this design in WEBENCH® Designer, click "Open Design" or click "Simulate Now" to go straight to simulations.

View: Schematic, Charts, BOM, dV/dt, Op Val, More

Update Components Download Schematic

Figure 2. After Conducting Your Part Search, Click "Preview Design" to Open Interactive WEBENCH to See Schematics, Plots, BOM and More - All for Your Design - without Leaving the Page.

Should the design preview tickle your fancy, you can now launch directly into the WEBENCH online design environment. Our hypothetical protagonist, Floyd, will love all of the new time-saving enhancements to TI's award-winning design tool:

- The generated schematic can now be edited. Components and/or wiring can be added to the design as needed if the user has unique system requirements.
- The schematic and simulation test bench can now be exported into the user's CAD tool. WEBENCH offers the ability to simply download the schematic and simulation files, including SPICE models, which can then be opened and manipulated in CAD software such as Altium, Cadence or [TINA-TI](#).
- Quickly and simply export the PCB layout. Similar to the schematic and simulation export tools, the thermal simulation layout can downloaded and opened in your CAD tool, saving hours.

A quick perusal of [SIMPLESWITCHER.com](#) has done wonders for Floyd. He has numerous potential solutions at his fingertips, his design timeline has been drastically reduced by using WEBENCH design tools, and his nerves have been calmed. Not only will he be able to meet his boss' deadline, he might even be able to make it to the ice cream social on Friday afternoon.

To try your hand at finding the perfect SIMPLE SWITCHER product for your design, visit [simpleswitcher.com](#) and enter your design parameters into the quick search.

Additional Resources

- Watch a video "[How 25 years of innovation is delivering 'Design Made Easy'](#)"
- Watch a video on the [new schematic and simulation export function within WEBENCH](#).
- [Explore reference designs and training material for powering FPGAs](#),

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