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Vendor DC-DC Converter Design Tool Calculates Inductor Losses More Accuately

Würth Elektronik's DC-DC Converter Designer, the most frequently used calculation tool in the company's REDEXPERT, has now been completely revised and expanded. The heart of the new tool is its proprietary, highly accurate method for calculating inductor losses, based on actual component characterization. It takes dc-bias effects in inductors and capacitors into account (see the figure).

In addition, the tool includes a new worst-case option for losses and temperature rise, enabling a more robust design that is prepared to deal with all real-world operating conditions, says the vendor.

The tool automatically selects the appropriate circuit topology based on the input parameters: buck (synchronous and asynchronous), boost (synchronous and asynchronous), and SEPIC. A user-defined topology mode is available to experienced users working with specialized or less common circuit topologies.

Additional filters for automotive requirements, shielding, and component height simplify component selection for specific applications. A link to the MagI³C Power Module Designer enables users to compare the discrete circuit with an integrated module solution to ensure the optimal solution is selected.

The tool's analytical capabilities have been significantly extended. The system recommends the five most suitable components based on a weighted evaluation of performance and package size. Multiple components can be compared directly: The same graph displays losses as a function of output current (I_{out}) and switching frequency (F_{sw}) for all selected components.

The graph options have also been expanded: zooming, a crosshair cursor, and exporting as an image or Excel file. Experienced users can manually load any component from across the Würth Elektronik portfolio into the tool without being limited to the automatic recommendation list. Another added feature, the tool now recommends capacitors and a suitable microchip controller for the specified input parameters. .

The overview page summarizes all simulation results and generates a complete bill of materials with up to six components. These components can be requested as free samples or added directly to the shopping cart. The DC-DC Converter Designer is available on the Würth [website](#).

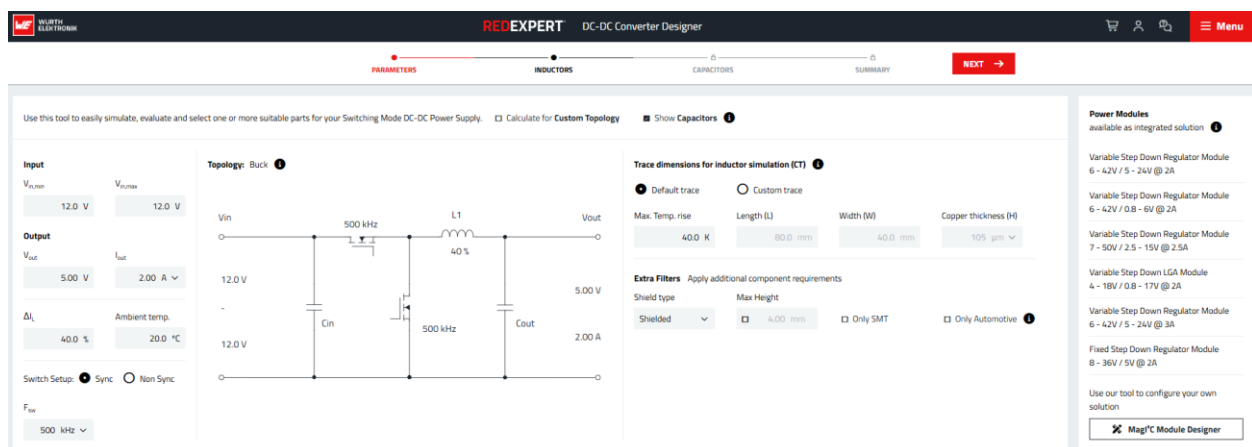


Figure. The inductance of a core changes significantly as a result of dc bias. Because datasheets often provide only limited information about this behavior, it is easy to select the wrong component. The same applies to ceramic capacitors, whose capacitance decreases significantly under operating voltage. The updated DC-DC Converter Designer accurately reflects this reality and provides loss and temperature estimates that more closely reflect the actual behavior on the circuit board.