NXP TEA2016 LLC RESONANT CONVERTER DESIGN TOOL

The NXP LLC resonant converter design tool helps engineers bridge design and decision-making gaps from system specifications to a complete set of paper designs with the help of a simple, sequential design flow.

OVERVIEW

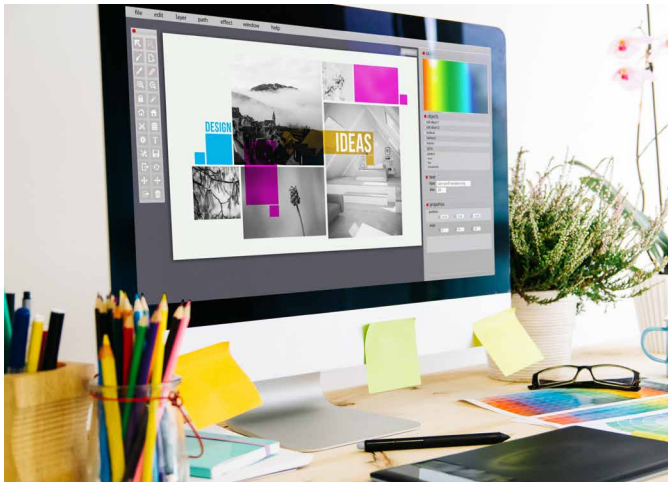
Completing and optimizing a near production-ready resonant converter design can be tricky, tedious, and even challenging. The main focus of the design tool is to address common issues/concerns proactively, such as worst corner case stress of each device, device tolerance/distribution effects to performance, and design optimization. As a result, we can cut design iteration, trial-and-error effort on bench, and development time. The design tool is written in Excel and can be downloaded from the NXP web siite.

FEATURES AND BENEFITS

- Detailed step-by-step sequential flow helps engineers to follow and complete designs easily
- Proactively assess worst-case and corner-case stress and thermal of devices
- Proactively assess device tolerance/distribution effects to system performance
- Fine knobs and guidelines to help engineers fine-tune design toward optimization
- Complete a paper design with schematic, BOM, and magnetic build sheets for the whole system
- Combining FHA-based LLC design with a downloadable SIMPLIS simulation mode helps saving iteration cycles

APPLICATIONS

- Desktop and all-in-one (AIO) PCs
- Gaming consoles
- TV power supplies (Ultra HD, 4K)



- Notebook adapters
- Lighting applications up to 350 W

SUPPORTING PRODUCTS

The TEA2016 is a digital configurable LLC and PFC combo controller. It provides high efficiency across all power levels. Combining with the TEA1995T/TEA2095T(TE) dual LLC resonant SR controller further enhances system efficiency at low cost.

A new generation of active bridge rectifier (ABR) TEA2208T/TEA2209T/TEA2206T controllers are introduced recently. Compared to conventional diode bridge rectifiers, these ABR can improve the power converter efficiency significantly.

- TEA2016AAT: Digital controller for high-efficiency resonant power supply
- TEA1995T/TEA2095T(TE): Dual synchronous rectifier controller
- TEA2208T/TEA2206T/TEA2209T: Active bridge rectifier controller

DESIGN TOOL BLOCKS AND FLOW

Six design blocks are available: Ringo setting, PFC design, LLC design, magnetic implementation, analysis, and schematic and BOM. The sequential flow runs from left to right as shown on spreadsheets at the bottom of the Excel file. For each design block, the flow runs from top to bottom sequentially.

HOW TO USE THE TOOL?

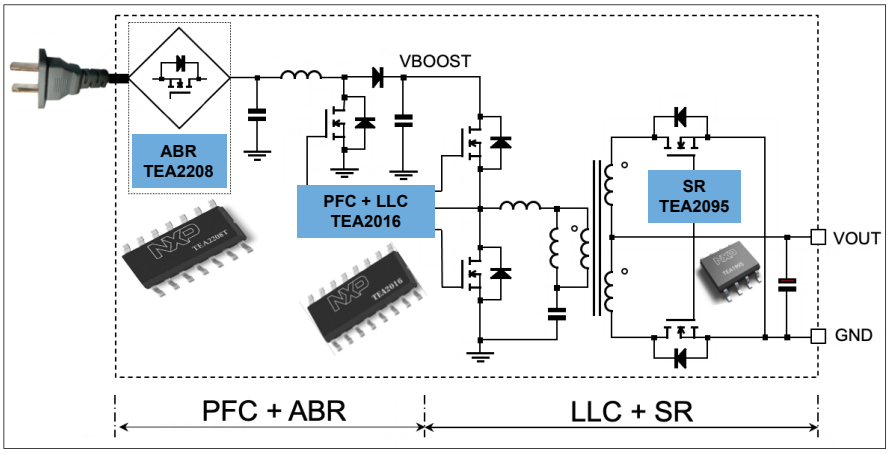
The Excel-based design tool is self-explanatory. The design tool UI and a few key elements are highlighted below.

- User input: To enter design or component parameters
- Default: Recommended parameters or calculation results
- Graphic area: To illustrate contents better
- Real-time design guides: Hover over "User input" or a description and a note pops up with and explanation or a design recommendation
- Precaution: If an entered "User input" is way off any reasonable design range, a "Caution" or "Warning" message pops up with an explanation or guidelines

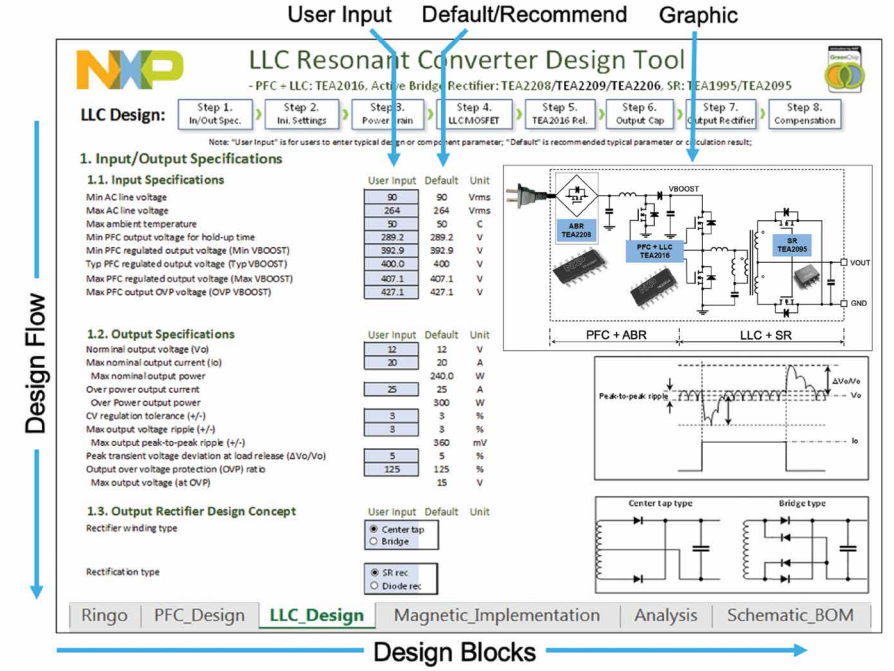
NXP GREENCHIP SOLUTIONS

The NXP GreenChip power solutions portfolio enables smarter, more compact, and energy-efficient power solutions. Complete GreenChip system solutions help optimize applications such as highly efficient power supplies and system protection.

SYSTEM CONFIGURATION: PFC + LLC RESONANT CONVERTER + ABR + SR



DESIGN TOOL BLOCKS AND FLOW



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