



# Switching Power Supply Design and Optimization, Second Edition

By Sanjaya Maniktala

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**Switching Power Supply Design and Optimization, Second Edition** By Sanjaya Maniktala

**The latest techniques for designing state-of-the-art power supplies, including resonant (LLC) converters**

Extensively revised throughout, *Switching Power Supply Design & Optimization*, Second Edition, explains how to design reliable, high-performance switching power supplies for today's cutting-edge electronics. The book covers modern topologies and converters and features new information on designing or selecting bandgap references, transformer design using detailed new design charts for proximity effects, Buck efficiency loss teardown diagrams, active reset techniques, topology morphology, and a meticulous AC-DC front-end design procedure.

This updated resource contains design charts and numerical examples for comprehensive feedback loop design, including TL431, plus the world's first top-down simplified design methodology for wide-input resonant (LLC) converters. A step-by-step comparative design procedure for Forward and Flyback converters is also included in this practical guide.

**The new edition covers:**

- Voltage references
- DC-DC converters: topologies to configurations
- Contemporary converters, composites, and related techniques
- Discontinuous conduction mode
- Comprehensive front-end design in AC-DC power conversion
- Topologies for AC-DC applications
- Tapped-inductor (autotransformer-based) converters
- Selecting inductors for DC-DC converters
- Flyback and Forward converter transformer design
- Forward and Flyback converters: step-by-step design and comparison
- PCBs and thermal management
- Closing the loop: feedback and stability, including TL431
- Practical EMI filter design

- Reset techniques in Flyback and Forward converters
- Reliability, testing, and safety issues
- Unraveling and optimizing Buck converter efficiency
- Introduction to soft-switching and detailed LLC converter design methodology with PSpice simulations
- Practical circuits, design ideas, and component FAQs

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### Editorial Review

#### About the Author

**Sanjaya Maniktala** is the author of *Power over Ethernet Interoperability* and several other books on power electronics. He has held lead engineering and managerial positions in India, Singapore, Germany, and the United States. Mr. Maniktala holds several patents in power conversion and Power over Ethernet, including the floating Buck regulator topology and Mode transitioning in a Buck-Boost converter using a constant duty cycle difference technique.

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