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14.3 Multiple-winding magnetics design using the Kg method  
The Kg design method can be extended to multiple-winding magnetic elements such as transformers and coupled inductors. This method is applicable when - Copper loss dominates the total loss (i.e. core loss is ignored), or

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Included are magnetics fundamentals, magnetic materials, catalog material on cores, various aspects of transformer and inductor design, transducers for flyback and forward converters, input filter design, current, rotary, planar, autotransformer and sat-

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Magnetic fieldsMagnetic fields provide the fundamental mechanism by which provide the fundamental mechanism by which energy is converted from one from to another by means of: •motors (electrical energy mechanical energy ) •gg(enerators (mechanical energy electrical energy)

Magnetics for Power Electronic Converters. This course covers the analysis and design of magnetic components, including inductors and transformers, used in power electronic converters. The course starts with an introduction to physical principles behind inductors and transformers, including the concepts of inductance, core material saturation,...

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es, high voltage spikes necessitating snubbers or clamps, poor cross regulation between multiple outputs, noise coupling to input or output, restricted duty cycle range, etc.

Inductor Design. Inductors are devices that store and convert energy. A BH loop characterizes the useful region of operation of a magnetic component. When a gap is introduced into the core either discretely, as in a ferrite or distributed, as in a powder core, the ability of the device to store energy is greatly enhanced,...

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Fundamentals: Inductors 101. Core losses: Core losses are caused by an alternating magnetic field in the core material. The losses are a function of the operating frequency and the total magnetic flux swing. The total core losses are made up of three main components: hysteresis, eddy current and residual losses.

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In magnetics, permeability is the ability of a material to conduct flux. The magnitude of the permeability at a given induction is the measure of the ease with which a core material can be magnetized to that induction.

Magnetic Component Design Problem • Challenge - conversion of component operating specs in converter circuit into component design parameters. • Goal - simple, easy-to-use procedure that produces component design specs that result in an acceptable design having a minimum size, weight, and cost. • Inductor electrical (e.g.converter circuit) specifications. •

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Fundamentals of Power Electronics Chapter 13: Basic Magnetics Theory  
 16 Inductor example: Ampere's law Choose a closed path which follows the average magnetic field line around the interior of the core. Length of this path is called the mean magnetic path length  $l_m$ . For uniform field strength  $H(t)$ , the core MMF around the path is  $H l_m$ .

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obtain High Q inductors at nominal AC excitation. The theory and design of high power inductors is outside the context of this presentation. Fig 3 The amount of flux density remaining is called the remanence (residual magnetism) of the magnetic material. 'Soft' magnetic materials, used in the manufacture of coil and Magnetics offers a number of inductor and transformer design tools and literature to assist engineers in optimizing their Magnetics components. Contact our Applications Engineers with your design questions.

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