

How do you calculate the inductance of a coil?

Calculate the inductance value of the coil by substituting the above parameters into equation (18-1) or (18-2). Coil selection should be based on the results of the calculations. For this design, 10uH is chosen as the closest standard inductance value.

How to design an inductor?

Each type of inductor is specific for a different application and the design procedure will be different. Reading the basics of inductor design, you have to choose a core (with a specific gap or distributed gap), and a winding (selecting the type of wire) to comply with some electrical specifications of inductance and current rating.

How to calculate inductance?

The formula allows you to calculate the inductance by knowing the maximum peak voltage of the output rectifier, the output voltage, the on-time of the converter at the maximum input voltage, and the minimum load current. You can calculate the minimum inductance using the above formula. The minimum required inductance is represented by L (min).

How do you calculate inductance based on inductor discharging mode?

Q1 is turned off in inductor discharging mode, where I_L drops and the inductor releases energy. The inductance (L) can be calculated based on the relationship between the voltage and current across the inductor. This relationship can be calculated with Equation (1): $V = L \times dI/dt$

How to calculate inductor core area product?

Figure 4. Inductor core area product calculation method, source: Chemo Molina, Frenetic One of the most common methods is the Area Product method, which consists of calculating a value using the energy stored (current and inductance), frequency, maximum magnetic field (determined by the material used), and current density through the winding.

How do you design a convection inductor?

Calculate DC and core losses. Keep current density below 5 A/mm²; for natural convection. Ensure total losses remain within thermal limits. Compare custom design results with catalog components from major manufacturers. This can reduce cost and speed up development. Learn how to design an inductor with practical steps and expert insights.

This calculator simplifies the process of calculating the energy stored in an inductor, making it accessible to students, educators, and professionals working in electronics and electrical ...

The formula allows you to calculate the inductance by knowing the maximum peak voltage of the output

rectifier, the output voltage, the on-time of the converter at the maximum input voltage, and the ...

This calculator provides a straightforward way to determine the energy stored in an inductor, serving as a practical tool for students, engineers, and professionals dealing with electronic ...

If the selected inductor value is different from the calculated result, adjust the current ripple value "r" using equation (17), and substitute the revised value into equation (19) to recalculate the maximum ...

This article discusses how to calculate the inductance of a buck converter using the MPQ2314 as well as key parameters including the rising current of the inductor temperature, saturation current DC ...

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Why choose a toroidal inductor over other types? Toroidal inductors offer higher inductance and efficiency with less electromagnetic interference, making them ideal for precision ...

The inductor ripple current cannot be calculated with Equation 1 because the inductor is not known. A good estimation for the inductor ripple current is 20% to 40% of the output current.

Inductors are manufactured in various materials and with a wide range of values, typically having a tolerance of $\pm 20\%$. Inductors have an inherent DC resistance (DCR) which impacts the performance ...

The inductor current calculation is crucial in electrical engineering, especially when designing circuits that involve inductance, such as filters, transformers, and energy storage devices.

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