Inductive energy storage grid circuit

A vacuum arc thruster is a type of micro-thruster based on pulsed ablative vacuum arc discharge. A simple inductive energy storage circuit in a vacuum arc thruster is particularly suitable for CubeSats because of its compact size and low cost. In practice, it is necessary to predict the thruster performance with the given design parameters. However, unlike the pulsed plasma ...

... plasma source uses inductive energy storage for the power process unit (PPU) similar to the one described elsewhere [13]. The equivalent circuit is shown in figure 1. The PPU operates...

As a result, when all capacitors and inductors are connected in series, the voltage generated on the load is from both capacitive energy storage and inductive energy storage. In the demonstration experiment, we have used a 4-stage Marx circuit to generate an output voltage with a peak value of ~9 kV on a 400-O load, with a charging voltage of ...

In DC circuits, the inductive effect causes the current to rise slowly, eventually reaching approximately the maximum value of current according to the circuit resistance. In an inductive AC circuit, the current is continually changing in value and direction, generating an induced EMF that must continually oppose the change of current flow ...

Their energy comes from the power grid. Intermediate energy storage devices include electric field energy storage (taking capacitors and Marx generators as examples), magnetic field energy storage (taking inductive coils at atmospheric temperature or superconducting inductive coils as examples), and mechanical energy storage based on ...

In this article, we propose a solid-state Marx circuit using inductive energy storage, where inductors play the role of principal energy storage element. When combined with an opening ...

The cooling cost of high temperature superconductors is much lower than that of low temperature superconductors. By now, a few HTSPPTs have already been tested based on inductive energy storage system [6], [7], [8] and capacitive energy storage system [9].High energy transfer efficiency can be obtained by using a HTSPPT in a capacitor-based pulsed power ...

They can be any T (or n) - network built using passive energy storage components. Some simplified tuning networks on the secondary side are shown in Figure 2. The output power of the circuit can also be written as in ...

For the CubeSat, the VAT is designed and built based on a design with an inductive energy storage (IES) circuit PPU and a simple coaxial thruster head geometry. 117 In the PPU, an inductor is ...

cathode arc thruster (VAT) was used in this study. An inductive energy storage device [6] in combination with trigger-less ignition methods [7] was implemented. This configuration ...

FOR AN INDUCTIVE ENERGY STORAGE CIRCUIT David P. Bauer John P. Barber IAP Research, Inc. 7546 McEwen Road Dayton, OH 45459 Capt. Gerald D. Clark Air Force Aero Propulsion Laboratory Wright-Patterson AFB, OH 45433 This work supported by US Air Force under Contract No. F33615-81-C-2024. The use of inductive energy storage ...

By now, a few HTSPPTs have already been tested based on inductive energy storage system [6], [7], [8] and capacitive energy storage system [9]. High energy transfer efficiency can be obtained by using a HTSPPT in a capacitor-based pulsed power supply [9], but the energy density of the whole system is still inadequate. As superconducting ...

The purpose of an opening switch is simply to stop the flow of current in the circuit branch containing the switch and to accomplish current interruption, the opening switch must force the current to transfer from the switch to a parallel circuit branch and then withstand the voltage generated by the current flowing through the load. The purpose of an opening switch is simply ...

The purpose of an opening switch is simply to stop the flow of current in the circuit branch containing the switch. Prior to this action, of course, the opening switch must first conduct the current as required--that is, operate as a closing switch. To accomplish...

A circuit design for matching an inductive energy storage to a utility grid and a complex load (railgun accelerator) is discussed. A circuit design is suggested for control of the discharge current to provide effective transfer of the energy stored in the inductive storage.

High energy retention with minimal leakage or losses in energy storage. Energy conditioning to ensure the output meets power requirements for the application or desired task. Tolerance of a wide range of voltages, currents, and other irregular input conditions. Application Circuit. Circuits receiving harvested energy for application should:

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