

When compared to "inductive" switching DC/DC converters, which use inductors as energy storage elements, charge pumps offer unique characteristics that make them attractive for certain end-user applications. This article will compare the architecture and operation of a regulated charge pump with that of the most widely used inductor-based ...

Inductive energy storage refers to the method of storing energy in a magnetic field generated by an electric current flowing through a coil of wire. This process is fundamental to devices like superconducting magnetic energy storage systems, where energy can be stored and retrieved efficiently, providing rapid power delivery when needed. The efficiency and effectiveness of ...

Energy harvesting represents an alternative power source technique to realize battery-less implantable medical device. In this paper, a specific kinetic energy harvester has been considered []. The electrical signal produced by a kinetic energy harvester is typically in AC form; therefore, the scavenged energy cannot directly power a device or a circuit and it cannot ...

Characteristics of inductive energy storage system pulsed power generator with semiconductor opening switch (SOS) diodes are investigated with focusing on an energy transfer efficiency from the generator to the resistive load. Fast recovery diodes VMI K100UF were used as SOS and were connected in series and/or in parallel to realize a large current and a high output voltage. ...

Compared with the nanosecond pulse generator based on capacitive energy storage, the inductive energy storage has outstanding advantages in energy storage density, miniaturization of the device, and less influence of loop inductance. However, the inductive energy storage also suffers from problems such as limitation of disconnect switch ...

In this paper, the principle of inductive energy storage (IES) is applied to twisted pair wire (TPW), served as energy storage unit for generating nanosecond pulse. As a kind of transmission line, the electromagnetic field constraint of TPW is realized by twisting, so it has greater bent flexibility than coaxial transmission line, which makes it ...

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.

2025 4 th International Conference on New Energy, Energy Storage and Power Engineering (NESP 2025)
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Inductive energy storage pump

The all-solid-state inductive energy storage pulse forming line modulator is a brand-new solution to achieve a high repetition rate, high voltage gain, and short pulse output. However, due to the non-ideal dynamic characteristics of the switch and the fixed physical space size of the transmission line, it's difficult to realize the generation and control of high-voltage short pulses.

energy from the initial capacitive storage unit is first transferred to the energy of a magnetic field induced by the current across an inductive element; then, the current is interrupted by a special breaker and the energy goes into the excitation of the active medium. Pulsed Gas Lasers Pumped by Generators with Inductive Energy Storage

To understand the energy conversion during VAT discharge, a high-voltage probe and current meter were used to measure the charging and discharging of the inductive energy storage circuit. Eq. (10) presents that the higher the inductance value, the higher is the amount of energy stored in the inductor. Three different inductors with inductance ...

When an inductive circuit is completed, the inductor begins storing energy in its magnetic fields. When the same circuit is broken, the energy in the magnetic field is quickly reconverted into electrical energy. This electrical energy appears as a high voltage around the circuit breakpoint, causing shock and arcs.

However, the inductive energy storage electromagnetic emission pulsed power supply puts high requirements for charging power supply, and the main problems, such as high voltage will be generated when the disconnect switch is turned off, need to be solved. ... Pumped high-powered laser weapons is a modern new-concept high-powered laser weapon ...

The advantages of inductive energy storage (IES) generators for increasing the pulse energy, power, and duration for nitrogen laser pumped by self-sustained transverse discharge have been experimentally demonstrated. A theoretical model is developed and the operation of IES-pumped laser on nitrogen-electronegative gas mixtures is numerically ...

A laser pumped by a pulse generator with an inductive energy storage unit and a semiconductor current breakers was constructed. The active medium of a nonchain HF laser was used to demonstrate the advantages of this generator. The output radiation energy was 0.5 J and the efficiency, in terms of the energy in the primary storage unit, was 3%.

Generators with inductive energy storage (GIES) are developed for laser application. Discharge and laser parameters in high-pressure gas mixtures are studied. It was shown that the IES generator produces high-voltage pre-pulse and sharp increase of discharge current which allows to form long-lived stable discharge in different gas mixtures. Improve of both pulse duration ...

The three components are used to consist of current pump circuit to replace the buffer circuit which is

Inductive energy storage pump

composed of the diode and RC network in the switching power supply. ... and use the inductive energy storage to extend the rectifier conduction time to reduce the input harmonic current range. When using this circuit, you should adjust the ...

Mechanical Gravity Energy Storage. Mechanical gravity energy storage systems use energy to lift heavy objects, such as concrete blocks, up a tower. When energy is needed, the blocks are lowered back down, generating electricity using the pull of gravity. This technology is less common but can be effective for long-term storage and high-energy ...

High-voltage square-wave nanosecond pulse generator has a broad application prospect in the fields of atmospheric low-temperature plasma, biomedicine and power equipment detection. Pulse forming line is an effective way to realize high-voltage square-wave nanosecond pulse output. However, the existing technology is difficult to coordinate the contradiction between the ...

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