Inductive energy storage conditions

Pulsed gas discharge is an important means of generating low temperature plasma. Short pulses with fast frontier show superior performance in terms of increasing the active particle content, ionization coefficient and electron conversion rate due to its higher voltage rise rate. The common nanosecond pulse generator is based on capacitive energy storage. Compared with the ...

The initial starting voltage spike as well as the energy to operate the vacuum arc are generated by a low mass (<300 g) inductive energy storage PPU which is controlled using +5 V level signals.

When designing the structure of the energy storage inductor, it is necessary to select the characteristic structural parameters of the energy storage inductor, and its spiral structure is usually ignored when simplifying the calculation, that is, the n-turn coil can be equivalent to N closed toroidal coils. Taking copper foil inductors as an example, the two ...

Use of this web site signifies your agreement to the terms and conditions. By using the technology of energy storage inductor and electro-exploding wire opening switch (EEOS) drived by pulsed ...

Pulsed power generation using solid-state linear transformer driver (LTD) with inductive energy storage has been experimentally studied. This is a feasibility study in order to ...

With the development of pulsed power technology and the expansion of its application areas, the requirements for pulsed high-voltage supplies are getting sophisticated. Many researchers are exploring new circuits or trying to improve the performance of the existing circuits. In this study, we introduce a variant circuit of the Marx generator based on hybrid ...

Pulsed power has been generated by using either capacitive energy storage (CES) or inductive energy storage (IES). In this article, the combination of CES and IES, which is called hybrid energy storage (HES), is studied. Both the capacitor and the inductor can be charged with initial energy and they can release their stored energy together either in series or in parallel with ...

Pulsed power generators using an inductive energy storage system are extremely compact and lightweight in comparison with those using a capacitive energy storage system. A reliable opening switch operated repetitively is necessary to realize an inductive pulsed power generator. Two kinds of repetitively operated opening switches have been developed in Kumamoto University. ...

Nanosecond pulse electric field (ns-PFE) can target the organelles in cells, which can induce tumor cell apoptosis. This interesting electrophysiological effect implies that it is possible to inhibit tumor recurrence and metastasis. Due to the anisotropy of biological tissue, higher requirements are put forward for the output impedance regulation ability and waveform of pulse generator, ...

Inductive energy storage conditions

Utilization of inductive storage in production of intense charged particle beams, laser beams, and hot dense plasmas of interest in thermonuclear fusion studies and in other research areas is very attractive because of its inherent compactness associated with energy storage in the form of magnetic fields. A major problem in utilizing inductive energy sources ...

The power supply systems for future electric weapons in mobile applications require energy storage devices that feature high power densities. These can either be superconducting inductive energy storage systems or high-voltage capacitors. In future mobile applications these pulse storage devices will most likely be energized from an intermediate storage buffer, like the ...

A high-voltage pulse generator with an inductive energy storage is described. Its operation is based on the current interruption by a thyratron. It was shown that a TGI2-500/20 thyratron is capable of reliably interrupting the current with an amplitude of 800-850 A in an inductive energy storage, forming from a low-voltage (0.5-2 kV) power source voltage pulses with an amplitude ...

R. Carruthers, Energy Storage for Thermonuclear Research,Proc. IEE, Part A Supplement 2, 106:166 (1959). Article Google Scholar E.M. Honig, Progress in Developing Repetitive Pulse ...

Capacitive energy storage have been widely used in area of pulsed power, however, it canpsilat be used in application which requires long time energy storage (for example, accumulation of solar energy) due to its electric leakage. Since the superconducting inductor has great carrying capacity and zero DC resistance, it can store energy with no loss over a long period of time. In ...

The initial starting voltage spike as well as the energy to operate the vacuum arc are generated by a low mass (<300 g) inductive energy storage PPU which is controlled using +5 V level signals. The thrust-to-power ratio has been estimated to reach up to ?20 mN/W. The vacuum arc thruster was tested at the Jet Propulsion Laboratory using W as ...

An inductive energy storage pulse power system is being developed in BARC, India. Simple, compact, and robust opening switches, capable of generating hundreds of kV, are key elements in the ...

The minimum expected value of V IN should be used in order to ensure sufficient inductor energy storage under all conditions. ... Inductive charger/discharger systems are always of the non ...

Electrophysical processes proceeding in a feed circuit containing a semiconductor opening switch and intermediate inductive energy storage are also considered. It is shown that the semiconductor opening switch controls the amount of energy in the inductive storage, and a high-voltage short prepulse with a peak pump power density of ~1 MW cm-3 ...

Pulsed power generation using solid-state linear transformer driver (LTD) with inductive energy storage has been experimentally studied. This is a feasibility study in order to explore this new approach by proving its

operation principle and demonstrating its typical performance. Magnetic cores in LTD modules are used as intermediate energy storage from which the electrical ...

In this paper, we investigate a water treatment method that sprays waste water droplets into a pulsed discharge space. For this method, it is important to apply pulsed voltages with a short pulse width and a fast rise to the electrode to realize high energy efficiency. An inductive energy storage (IES) circuit using a semiconductor opening switch (SOS) outputs ...

Inductance Value: Measured in henries (H), this value reflects the energy storage capability of the component. This magnetic energy storage property makes inductors essential for a range of ...

For pulsed power generation, the energy storage unit is one of the most fundamental components. The common energy storage methods in the current pulse power systems are capacitive energy storage (CES) and inductive energy storage (IES), each with its own advantages and disadvantages. In this study, we have tested a circuit using both CES and ...

The high-voltage pulse generator is based on an inductive energy storage unit and a semiconductor opening switch, and the latter ensures a high pulse repetition rate.

This paper describes an S-band vircator system with electron beam premodulation, built on the base of the MARINA compact high-voltage pulser with inductive energy storage. The peak microwave output was /spl sim/1 GW with /spl sim/5% power efficiency and 50-ns full-width at half-maximum. The microwave frequency was constant during the pulse as determined by the ...

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 ...

Considering the above requirements, there are several basic concepts that can be used for high-voltage pulse generation. The key idea is that energy is collected from some primary energy source of low voltage, stored temporarily in a relatively long time and then rapidly released from storage and converted in high-voltage pulses of the desirable pulsed power, as ...