

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. ... Figure 1.13 shows a schematic diagram of a capacitor energy storage pulse power supply ...

An inductive energy storage switch system for the destruction of solid materials is reported. This is based on creating a pulsed electric breakdown in the solid dielectric, which then propagates in the specimen. This scheme provides a higher destruction effectiveness compared to a capacitive energy storage system. The higher energy efficiency is attributed to ...

Extended Summary ? pp.549-554 -4- Effect of Pulse Width on Ozone Yield using Inductive Energy Storage System Pulsed Power Generator Ippei Yagi Student Member (Iwate University, t3308022@iwate-u.ac.jp) Seiji Mukaigawa Member (Iwate University, mukaigaw@iwate-u.ac.jp) Koichi Takaki Member (Iwate University, takaki@iwate-u.ac.jp) ...

Abstract: 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.

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 ...

This magnetic field then stores energy. When the current is interrupted, the collapsing magnetic field induces a voltage in the inductor, releasing the stored energy in a pulse. Types of Inductive Energy Storage Devices. Linear Inductive Energy Storage 1: Linear inductive energy storage involves the use of linear inductors. It has a simple ...

The energy storage inductor is the core component of the inductive energy storage type pulse power supply, and the structure design of the energy storage inductor directly determines the energy storage density that the power module can achieve. Genetic algorithm is...

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 ...

A compact pulsed high-voltage generator has been developed for applications in pulsed gas discharges. Its operation principle is based on inductive energy storage and it uses a static induction thyristor as the opening switch. It is capable of generating pulsed high voltage of ~15 kV with pulse width of ~200 ns for load resistance of 1 k $\Omega$ . This generator can be ...

Two methods of output voltage adding using pulse forming lines (PFLs) have been studied and compared. Both methods use inductive energy storage (IES) instead of traditional capacitive energy storage (CES), which means that the PFLs are charged by current instead of voltage. One of the methods (Type A) used an additional transmission-line-transformer (TLT) to achieve the ...

The pulsed power generator, named ASO-I, is extremely compact and light in comparison with a conventional pulsed power generator, which consists of a Marx bank and a water pulse ...

To solve this problem, in this paper, a new multi-switch inductor energy storage forming line topology is proposed, and the time-space transmission process of electromagnetic waves in ...

--A high-voltage pulse generator with an inductive energy storage is described. Its operation is based on the current interruption by a thyatron. It was shown that a T ... < 2-500/20 thyatron is capable of reliably interrupting the current with an amplitude of 800-850 A in an inductive energy storage, forming from a low-

The plasma opening switch (POS) has been used for pulse compression and power amplification in a variety of inductive energy storage systems with conduction times ranging from tens of nanoseconds ...

The pulsed power generation from the inductive energy storage system, which is extremely compact and light, is investigated by the two-staged opening switches of fuses and a plasma erosion opening switch. The current rise time decreases from about 1  $\mu$ s to about 200 ns by the fuses, and then to about 100 ns by the plasma erosion opening switch.

Summary form only given. By using the technology of energy storage inductor and electro-exploding wire opening switch (EEOS) driven by pulsed capacitors, we studied the inductive-energy-storage pulsed power source. Based on the researches of EEOS with different material, different parameters and different quench medium, an excellent opening switch has ...

The pulsed power generator by an inductive energy storage system was investigated. The pulsed power generator named ASO-I is extremely compact and light and has a two-staged opening switch, which consists of fuses and a plasma erosion opening switch. The ASO-I generates the output of 300kV and 40kA and can produce pulse-train easily. Here, the ...

The application of inductive energy storage in the generation of high-current pulses has attracted considerable

# Pulse inductive energy storage

attention during recent years. In this article, a new inductive high-current pulse generator circuit is proposed based on XRAM (MARX spelled backward) current multiplier converter concept and multistage pulse transformers by using power ...

A compact pulsed high-voltage generator has been developed for applications in pulsed gas discharges. Its operation principle is based on inductive energy storage and it uses a static induction ...

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.

There have already a lot of circuit topologies for pulsed power generators using semiconductor switches. In this article, a novel circuit topology concept that can generate bipolar pulses based on linear transformer driver (LTD) topology is presented. Different from traditionally capacitive energy storage (CES) method, we utilize magnetic core as inductive energy storage ...

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 development of inductive energy storage pulsed power sources. It employs an inductive energy storage and opening switch power conditioning techniques with ...

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. ...

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.

Nitrogen oxide (NO<sub>x</sub>) removal is being studied for exhaust-gas treatment by pulsed discharge. A recently developed pulsed-power source using inductive energy-storage was used as the high-voltage generator, which drives corona discharge in a small reactor cell. The whole system is very compact, lightweight, and low-cost. It is possible to be operated with ...

Pulsed current generators using inductive energy storage (IES) can satisfy this demand, and there have been many studies on inductive pulsed current generators [12,13,14,15]. When the current flowing through the inductor changes, counter electromotive force will be generated at both ends of the inductor to maintain the original current amplitude.

Considering the above requirements, there are several basic concepts that can be used for high-voltage pulse

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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 ...

The pulse amplitude obtained on the load will be higher than that on the primary energy storage unit so as to get a higher voltage gain. In ref., a solid-state Marx circuit using inductive energy storage is proposed. Inductance is added to each stage of Marx as the energy storage element and charged by the primary energy storage element capacitor.

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.

An inductive energy storage switch system for the destruction of solid materials is reported. This is based on creating a pulsed electric breakdown in the solid dielectric, which then propagates in the specimen. This scheme provides a higher destruction effectiveness compared to a capacitive energy storage system. The higher energy efficiency is attributed to a different discharge ...

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 Systems Utilizing Inductive Energy Storage, 4th IEEE Pulsed Power Conf., IEEE Pub. No. 83CH1908-3 (1983). Google Scholar

For instance, in case of a transmission line, inductive energy can be stored by creating a current in the line and can be released by interrupting it. Figure 1 shows two examples of pulse forming line using inductive energy storage, both circuits consist of an initial energy storage capacitor, a switch (MOSFET), and a transmission line (PFL).

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