Pulse inductive energy storage

The results of the study and development of high-power nanosecond pulse generators with an intermediate inductive energy storage and semiconductor opening switch are generalized. The physical processes that determine the mechanism of operation of high-power opening switches, which are based on the effect of interruption of high-density currents in semiconductor diodes, ...

The inductive energy storage pulsed power generator using GaN FETs as opening switches has developed, and the output obtains a maximum voltage of ~900 V with rise/fall ...

Inductive energy storage type pulse power supply has great advantages in energy density and has far-reaching development potential. The XRAM pulse power supply based on series charging and parallel discharge ...

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 ...

By using the technology of energy storage inductor and electro-exploding wire opening switch (EEOS) drived 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 been developed. On the basis of ...

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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 ...

o Energy storage -Pulse discharge capacitors -Marx generators -Inductive energy storage 4 Outlines o Switches -Closing switches -Opening switches o Pulse-forming lines -Blumlein line -Pulse-forming network -Pulse compressor 5 o Pulse transmission and ...

Energy harvesting storage hybrid devices have garnered considerable attention as self-rechargeable power sources for wireless and ubiquitous electronics. Triboelectric ...

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...

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) ...

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.

To improve the pulse shape and to obtain /spl mu/s order pulse duration on a diode load in an inductive energy storage system, an oil-submerged compact pulse transformer with diameter of 20 cm and ...

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 ...

A compact high-current pulse generator with the amplitude of the load current up to 140 kA and rise time below 200 ns is designed. The basic element of the pulse generator design is the HCEIcap ...

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

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 ...

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 ...

FIGURE 1. A laser-diode driver uses inductive energy storage with a hysteretic, current-mode, buck regulator (top). Schematic block labeled "I Sensor" is the low-bandwidth current sensor used to monitor the current in the ...

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 ...

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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.

The present paper describes a new architecture of a high-voltage solid-state pulse generator. This generator combines the two types of energy storage systems: inductive and capacitive, and ...

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 described ...

It is a new way to obtain nanosecond high voltage pulse by employing inductive pulse forming line and voltage adder technology. In this paper, the basic principle of the generator is described, and two kinds of prototype pulse generators (single line and double line types) are fabricated by using coaxial cable and MOSFET switch to demonstrate this idea. The preliminary experiments, in ...

The principle of the superconducting inductive energy storage and of superconducting pulse switching is reviewed. Design criteria are discussed by introducing two different laboratory set-ups. Special emphasis will be laid on the methods of charging the energy storage and on the pulse switching. The layout and dimensioning of an experimental pulsed power supply with an ...

Currently, the design and efficiency optimization of high energy storage density inductors pose a significant challenge for inductive energy storage pulse power supply ...

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 ...

current pulse to the railgun load . And the function of the railgun load is to accelerate the projectile with the energy from the PPSs. According to different energy storage forms, PPSs can be classified into three major kinds, namely, capacitive, inductive, and rotating mechanical [5]-[6]. For preciseness, the inductive

Pulse forming line (PFL) is one of the effective ways to generate nanosecond pulse. The electrical parameters and geometric dimensions of the dielectric in the PFL are fixed, which causes its ...

3. Inductive Energy Storage with Opening Switch Pulsed power generator using inductive energy storage is known to be suitable to relatively high-impedance load. For this reason, it is widely studied recently for applications to atmospheric discharges of very short pulse length. Inductive energy storage scheme needs an opening switch with

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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 ...

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