Pulse inductive energy storage

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 ...

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 ...

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 ...

oEnergy storage -Pulse discharge capacitors -Marx generators -Inductive energy storage 3 Outlines oSwitches -Closing switches -Opening switches oPulse-forming lines -Blumlein line -Pulse-forming network -Pulse compressor oPulse transmission and ...

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.

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 ...

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 ...

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 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, ...

proposed, such as fast pulse edge, low current ripple. This paper proposes a multiphase interleaved pulse power supply with energy recovery and inductive storage (MIEF-PPS). The basic concept of the topology is the inclusion of a multiphase converter with pulse forming circuits to the converter system, which decouples the

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 ...

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 ...

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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 ...

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 ...

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 ...

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 ...

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 ...

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 ...

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 ...

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.

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 ...

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

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

High-voltage square-wave nanosecond pulse generator has a broad application prospect in the fields of atmosphericn 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 ...

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

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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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 ...

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 ...

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