

APPLICATION OF DEMPHERS IN INVERTERS OF SOLAR POWER SYSTEMS.

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Annotation. The use of solar energy is the conversion of light energy from the sun into other types of energy. DEMPFER (German: Dampfer - extinguisher) 1) Dampfer used.

Key words: Dampers, Diode, Transistor, Snubber, resistor.

Introduction. Snubbers are passive chains that keep the voltage signal from rising. It is usually used to hold devices or to control radio waves from a supply source. Vibration contour with dampers (resistor R with L-C-chain) losses. Their use has many advantages. Semiconductor components are now more durable, so the usual use of RLC-dampers for protection has decreased, but over time, dampers are still used.

In the field of modern pulse supply sources with large FICs, it is aimed at recovering energy from signal generation chains and returning it to the supply chain for later use. In this case, dampers come to the rescue without losses. Although it is important to minimize losses for a modern pulsed power supply, we consider two different dampers.

Normal damper.

A conventional damper (Figure 1) is used to keep power bipolar transistors from changing. It is also used to reduce electromagnetic interference. The dv / dt ratio of such rectifiers is controlled.

Figure 1. A simple damper switch circuit built into a field-effect transistor.

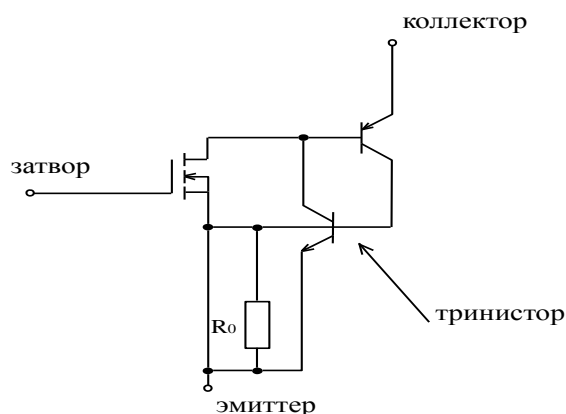


Figure 2. Structure diagram of IGBT transistor .

1. The design of such a damper is very important, because if it is done incorrectly, it will lose more power than required. In this case, the design of the damper is based more on empirical data than on the theoretical approach. The dampers affected by the damper vary depending on the parasitic elements in the circuit. After the physical structure of the circuit, it is necessary to create a damper, that is, to build the first model of the circuit board, transformer, switch and rectifier.

2. Measurement of the "sound" period in an undamped signal

3. Place a high-frequency capacitor in the primary circuit of the transformer, rectifier or other element to be damped. Determination of the capacitance of a capacitor giving three times the period of oscillations (S_0).

4. 4. Determine the approximate resistance of the resistor in series with the capacitor: $R = \frac{1}{2\pi F_0 C_0}$

There are combinations of R and S that give a satisfactory shape of the waves. However, as their value increases, losses decrease and FIC increases. If it is necessary to change the values of R and S, then increasing the resistance and reducing the capacity will provide small losses.

Today, there is a strong global focus on improving energy efficiency and using environmentally friendly, renewable energy sources (QTEM). This is due to the fact that the efficient use of alternative energy sources not only saves the

reserves of mineral resources, but also reduces the amount of harmful gases emitted into the atmosphere. Today, damper inverters are widely used in the use of solar energy. The main purpose of using dampers in inverters is to attenuate the impulse of electrical signals.

Dampers (Snubber) are passive chains that prevent a sudden increase in voltage in the chains during the switching process.

Typically, dampers have been used in electronic devices to protect transistors from secondary breakdowns and to reduce the frequency of high-frequency waves in pulsed power supplies.

Vibration contour with dampers (resistor R with L-C-chain) losses. Their use has many advantages. Semiconductor components are now more durable, so the usual consumption of RLC-dampers for protection purposes has decreased, but from time to time dampers are still used.

In the field of modern pulse supply sources with large FICs, it is aimed at recovering energy from signal generation chains and returning it to the supply chain for later use [1].

It is a means of redirecting the energy of the damper changes without losses, and as far as possible it is restored at the input or output of the supply source. It is very important to send energy to the place where it is used, otherwise it will be lost.

The transition period of the key interrupt causes significant changes. The main reason for this change is the energy, which is stored in the parasite and magnetic compote before the output rectifier is turned on.

During the correct recovery period of the rectifier, its circuit is open and the magnetic energy stored in all joints of the alternating current causes large changes in voltage. A diode is used in a passive damper without losses. The dv / dt ratio is passed through a discharged capacitor.

The degree of deceleration is determined by the capacitance of this damper capacitor. When the voltage across the capacitor is equal to the voltage at the end of the transition, the energy received by the capacitor must

be directed to the desired location for the next cycle. For each topology there are lossless dampers, which are given in many different forms.

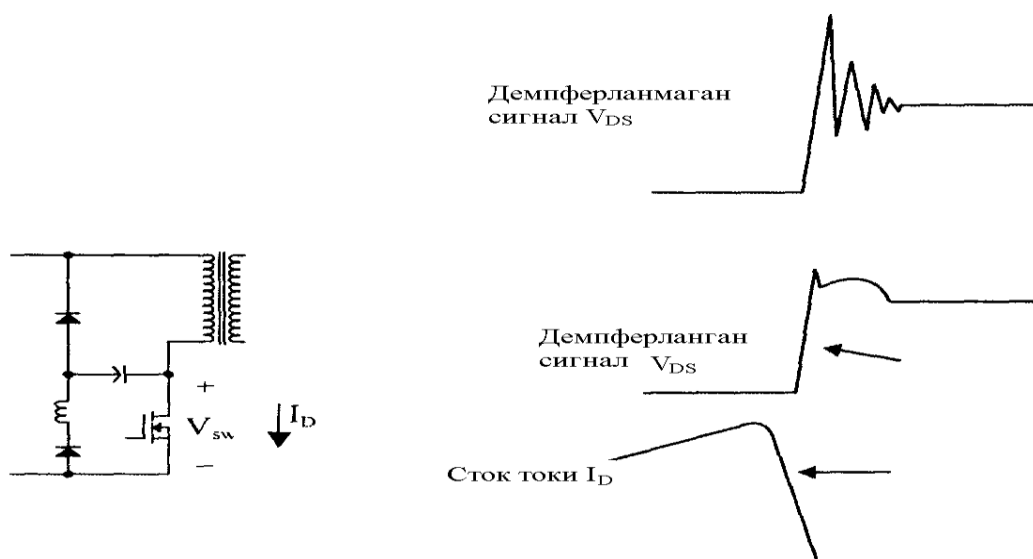


Figure 3. Scheme of application of passive damper in inverters

One of the forms of lossless dampers for a single-transistor converter with a shielded transformer is shown in Figure 1.

In the initial state of the damper capacitor - the voltage is zero. During the transition process in the opening, the voltage across the collector or switches exceeds the input voltage, the capacitor receives energy and charges. The capacitor is charged until the voltage across the collector returns to ground level, and then discharged through the diode and inductor. This cycle is repeated. The losses of this type of damper are reminiscent of the control losses in a powerful MOP transistor.

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