

New Generation of High Voltage Picosecond Generators Based on FID Technology

Vladimir M. Efanov, Pavel M. Yarin, Alexander V. Kricklenko
FID GmbH, 25 Werksstrasse, Burbach, D-57299, Germany,
<http://www.fidtechnology.com>

Until the recent time pulsers with the amplitude of up to 10 kV had the rise time of 80-100 ps at the pulse repetition rate of up to 100 kHz. Rise time was fundamentally limited by the turn on time of the FID devices that were used in such pulsers.

A large volume of theoretical and technological research work conducted by FID GmbH allowed to create a new generation of FID switches with the turn on time of about 25-30 ps at the operating voltage of 5-7 kV, the peak current of 200-300 A and the maximum repetition rate of more than 100 kHz.

Using the new generation of FID switches a new series of high voltage pulse generators has been created. Pulsers have the output voltage of up to 7 kV and the rise time of 25-30 ps. Pulse width is in range from 0,2 to 2 ns, maximum PRF is up to 100 kHz. Timing stability of the output pulse with respect to the triggering pulse is better than 10 ps.

The pulsers have a highly compact size of 200x300x120mm, including the universal AC 110-240 V power supply, both internal and external triggering.

A short turn-on time of FID switches ensures the high efficiency of the pulse generators. At the pulse duration of 500-1000 ps the currently achieved efficiency is 60-70%. New picosecond pulsers have the forced air or convectional cooling systems instead of oil or water pumping, which makes them very convenient in use.