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Development of Compact High Voltage Power supply for -40kV Long Pulse

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This paper proposes a compact high-voltage pulse power supply consist of interleaved capacitor charging power supply (CCPS) with a series resonant converter (SRC) to drive cathode of Magnetron Injection Gun (MIG). Requirement specifications are -40 kV, -7A(280 kW) and few seconds continuous output with less than 1ms the rising and falling time and lower than $\pm 1\%$ the ripple stability of output voltage at same time. To meet the requirement specifications, eight stacks operated in parallel and each stack has 45 degree phase shift switching was used. Each designed CCPS can supply the -0.9 A current and -40 kV voltage. Also, the proposed CCPS has a series resonant converter meeting simplicity of control. To prove the validity, this paper is confirmed by the simulation and experimental results of fabricated CCPS with -40 kV output.

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