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## Design of Active Voltage Droop Compensator for Solid-State Long Pulse Modulator

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This paper describes the design of an active voltage droop compensator for solid-state long pulse modulator. For generating long pulse with low voltage droop, the active droop compensation technique provides advantages in terms of the high power density and low cost. The proposed droop compensator required to generate triangular waveform consists of the resonant converter and the flyback converter. The resonant converter at DCM operation allows linear charging of the compensation capacitor owing to its pure current source characteristic. The flyback converter recover the charged energy from the compensation capacitor to input and provides fast falling of compensator output voltage. Based on the proposed topology, a compensator that has 1 kV and 26 A of the maximum voltage and current specifications is developed for a 40 kV, 20 A, 300 $\mu$ s, 200Hz, 0.5% droop solid-state pulsed power modulator. Finally, it was experimentally verified that the proposed compensator can be effectively used for achieving low voltage droop by means of the series operation with the existing solid-state pulsed power modulator.

**Primary authors:** Mr NIMO , Appiah Gideon (University of Science & Technology ); Mr BAE, Jung-soo (University of Science & Technology ); JANG, Sung-Roc (KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE); Dr KIM, Hyoung Suk (KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE ); RYOO, Hong-Je (Chung-Ang University); Mr YU, Chan Hun (KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE )

**Presenter:** JANG, Sung-Roc (KOREA ELECTROTECHNOLOGY RESEARCH INSTITUTE)

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