

저온소결 PMN-PNN-PZT계 세라믹스를 이용한
Rosen형 압전변압기의 전기적 특성

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**Electrical Properties of Rosen Type piezoelectric transformers using
Low Temperature Sintering PMN-PNN-PZT ceramics**

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Abstract : Piezoelectric transformers have been widely used such as DC-DC convertor, inverter, Ballast, etc. Because, they have some merits compared with electro-magnetic transformers such as step-up ratio, high efficiency, small size and light weight, etc. Piezoelectric transformer require high electromechanical coupling factor k_p in order to induce a large output power in proportional to applied electric field. And also, high mechanical quality factor Q_m is required to prevent mechanical loss and heat generation. In general, PZT system ceramics should be sintered at high temperatures between 1200 and 1300°C in order to obtain complete densification. Accordingly, environmental pollution due to its PbO evaporation. Hence, to reduce its sintering temperature, various kinds of material processing methods such as hot pressing, high energy mill, liquid phase sintering, and using ultra fine powder have been performed. Among these methods, liquid phase sintering is basically an effective method for aiding densification at low temperature. In this study, In order to compare on low temperature sintering and solid state sintering piezoelectric transformers, rosen type transformers were fabricated using two PZT ceramics compositions and their electrical properties were investigated.

Key Words : rosen type transformers, electromechanical coupling factor k_p , mechanical quality factor Q_m , low temperature sintering, solid state sintering