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Status and performance of 150 kW RF solid state power amplifiers for the RFQ cavity

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The RAON facility, under the Institute for Basic Science (IBS) in Daejeon, is an advanced accelerator complex designed for research involving rare isotopes. RAON uses different types of cavities to accelerate various ions. The 81.25 MHz RF superconducting Radio Frequency Quadrupole (RFQ) cavity plays a key role in the initial acceleration of the ion beam. Supplying RF power efficiently to this RFQ cavity requires a total of 150 kW of RF power from Solid State Power Amplifiers (SSPAs).
To fulfill this requirement, the RF group initially developed a 20 kW SSPA. The developed 20 kW SSPA showed good performance in frequency stability, power amplification efficiency, and thermal management. Based on these good performance results, several 20 kW SSPAs were combined to make two 80 kW SSPAs, meeting the RF power requirements for the RFQ cavity.
In this paper, we present the development process and performance results of the 80 kW RF SSPAs.

Footnotes

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