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An Optimized Water Cooling Scheme of Solid State Power Source for Accelerator

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The accelerator high-power system provides electromagnetic energy to the acceleration structure to establish a high-power acceleration field. In pace with the current intensity development of accelerator beam, heightening RF system performance is put on a new agenda. Temperature is a momentous parameter of accelerator RF system, which will directly affect the mechanical, electromagnetic and signal stability of high frequency system. Therefore, an optimized water cooling scheme for solid-state power source is designed to obtain the most reliable and convenient cooling system with the least cost. Firstly, the diverter of the overall water cooling system is designed to ensure that each power amplifier module can achieve the same heat dissipation effect when output the same power. Next, the runner of a single power amplifier module is optimized to ensure that the pressure at the plug connector is appropriate. Finally, the power module is designed in the form of water and electricity separation, that is, the way of contact cooling is adopted to increase the maintainability.

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Footnotes

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