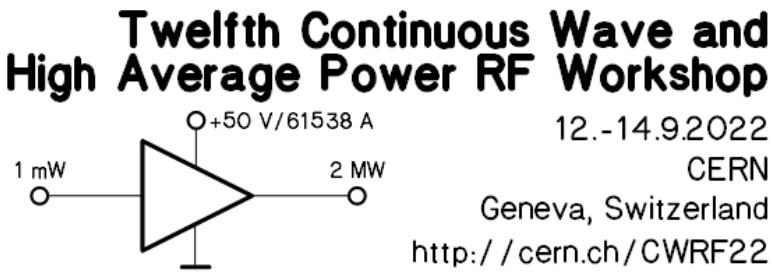

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Construction and Installation of a 320kW Solid State Power Amplifier for Taiwan Photo Source.

Monday 12 September 2022 14:00 (25 minutes)

It took a decade to develop the 500-MHz module for the Solid State Power Amplifier (SSPA) in NSRRC. Performance of a single module was gradually improved to reach a steady output power of 960W by using the RF chip IC-BLF578XR. Heat dissipation unit and high-efficiency power supply are key issues in improving integral performance (49.5% RF power) of the single module. A 110-module SSPA tower was first constructed to generate 80 kW CW RF power. Next this 80-kW tower was successfully combined with a 100-kW klystron-type RF source to generate 160 kW RF power to finish the conditioning of power couplers (CPL) and off-line high-power test of a KEKB-type SRF module in the RF laboratory. Based on these operation experience, four towers of modified SSPA were then constructed and successfully combined to generate 320 kW RF power, in which the RF chip in each module is upgraded to IC-BLF578. This 320-kW SSPA station is applied to the on-line high-power test and CPL aging of a KEKB-type SRF module in 2021-2022. However, reduction on module damage rate during CPL aging, higher operation stability, greater energy efficiency, and suppression on acoustic noise are the challenges foreseen.

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