

A.18: Development and installation of 650 MHz RF system at Vertical Test Stand

RRCAT has installed a Vertical Test Stand (VTS) Facility where the SCRF cavities are characterized under cryogenic conditions (2 K and 4.2 K). An LLRF system and a 500 W, 1.3 GHz SSPA based high power supply have been previously developed for characterization of 1.3 GHz cavities at RRCAT VTS. The 1.3 GHz RF system was successfully used during previous year for characterization of 4 single cell Nb cavities. To enable testing of 650 MHz single cell and multicell cavities a new LLRF system and a 650 MHz, 500 W, CW amplifier has been developed and installed at RRCAT VTS site. The Fig.A.18.1 shows the LLRF system installed in the control room. Fig.A.18.2 shows the 500 W SSPA installed in the VTS pit. Fig.A.18.3 shows the frequency and gain response of the SSPA.



Fig A.18.1: 650 MHz LLRF system installed at the VTS control room.

The new VTS LLRF system has been developed using the similar components as used in 1300 MHz system to ensure its compatibility with the existing control and data acquisition system. All components were tested and verified for their suitability at 650 MHz before installation. The LabView based software of the 1300 MHz system was upgraded to be used for both 650 MHz and 1300 MHz cavities. Also software routine for automatic identification of optimized phase for PLL operation has been developed and incorporated

in the system which will help in reducing test time and will improve accuracy of results.



Fig. A.18.2: 650 MHz, 500 W, SSPA installed at the VTS pit

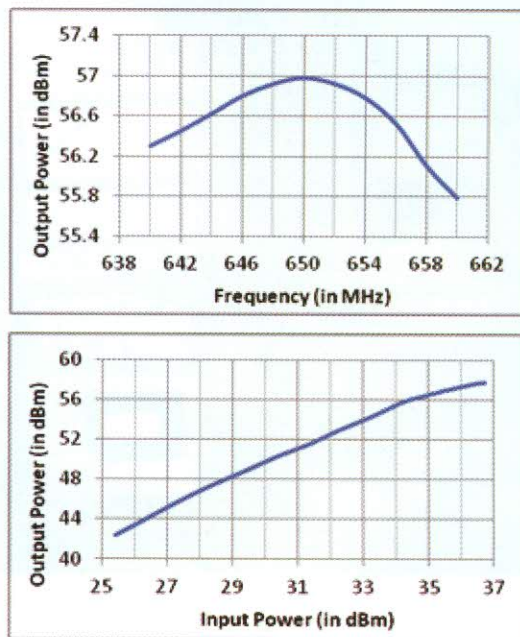


Fig. A.18.3: Frequency and gain response of the 500 W 650 MHz SSPA installed at VTS.

The new 650 MHz system has been developed in a single 4U chassis against the old system which used four 3U enclosures; this reduces the complexity of the system and requires less rack space. This is achieved by redesigning the RF system making it compact and easier to use. The hardware and software of the new 650 MHz has been thoroughly tested and installed at the VTS site. The performance of amplifier system has also been thoroughly verified. Both the LLRF and the HPRF system are ready to be used.

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