Design of Booster Synchrotron for MUSES, T. KATAYAMA, INS; T. OHKAWA, RIKEN - The Booster Synchrotron Ring (BSR) is proposed for RIKEN RI beam factory. The BSR is part of Multi-Use experimental Storage Rings (MUSES). The BSR functions exclusively for acceleration of ion and electron beams. The maximum accelerating energy is then, for example, to be 3 GeV for proton; 1.45 GeV/u for light ions of q/A = 1/2; 800 MeV/u for heavy ions of q/A = 1/3. In this paper some results of a search for a lattice of the BSR are presented. In this search, the ring circumference (134.787 m), the maximum Bρ-value (14.6 Tm) are fixed, and chromaticity is corrected by two families of sextupole magnets. We have calculated RF parameters of the BSR. Provided that the dilution factor is 2, the maximum RF voltage is required to be about 200 kV. And we present the results of numerical simulation of a synchrotron oscillation so as to optimize a dilution factor.