Abstract: In this work we have studied the Bean critical state model (BCSM) in hard type II superconductors. The study has been aimed towards the determination of the critical current density J_c and its temperature dependence using analyses of a temperature dependence of a magnetic susceptibility χ_{ac} measured by a contactless method using SQUID magnetometer. We have compared the predictions of the BCSM for the four geometries: slab in a parallel field, long cylinder in an axial field, and disk and strip in a transverse field. The main interest of the present study is the χ_{ac} of the superconducting thin films (disk and strip). We have measured the magnetic response of Nb thin films and second-generation high temperature superconductor $YBa_2Cu_3O_x$ wire in a perpendicular AC field as a function of temperature as well as bulk NEG-123 sample in parallel magnetic field. We have presented a method of linking model and experimental susceptibility. The good agreement of experimental susceptibility with model of 2D disk allows noncontact estimation of the critical depinning current density and its temperature dependence. Harmonic analysis of the temperature dependence of the nonlinear χ_{ac} gives excellent agreement with the susceptibility calculated on basis of 2D BCSM to disk.