In the present day of technology, the product is actuator combined with piezoelectric are widely used on the market. For example: printer inkjet actuators, piezoelectric speaker, and etc. At the same time, the characteristics of piezoelectric be going to taken seriously. So how to improve is certain to carry weight. This paper mainly discusses the affect of characteristics by different polarization electric field and temperature on the piezoelectric. The thickness of experimental piezoelectric film have four types: 200μm, 400μm, 600μm and 800μm. The experimental results obtained in the polarization temperature of 100℃. The polarization electric field in 0.5v/μm piezoelectric film thickness of 200μm, the is 401.6(pm/v), the relative dielectric constant of 3316.235, and the electromechanical coupling factor of 0.55. The polarization electric field in 1v/μm piezoelectric film thickness of 400μm, the is 464.6(pm/v), the relative dielectric constant of 3784.683, and the electromechanical coupling coefficient of 0.50. The polarization electric field in 1.09v/μm piezoelectric film thickness of 600μm, the is 505.6(pm/v), the relative dielectric constant of 3450.904, and the electromechanical coupling coefficient of 0.51. The polarization electric field in 1.33v/μm piezoelectric film thickness of 800μm, the is 520.3(pm/v), the relative dielectric constant of 3276.913, and the electromechanical coupling coefficient of 0.51.